COESAM/PDFP-90/002

(2)

SECTION 107

DETAILED PROJECT REPORT

Fort Gaines Channel
(Government Cut)
AT
DAUPHIN ISLAND, ALABAMA

US Army Corps
of Engineers
Mobile District
South Atlantic Division

MARCH 1990

CWIS # 87617

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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COESAM/PDFP-90/002

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, ALABAMA 36628-0001

REPLY TO
ATTENTION OF:

Plan Development Section

SECTION 107

DETAILED PROJECT REPORT

ON

FORT GAINES CHANNEL
(GOVERNMENT CUT)

AT

DAUPHIN ISLAND, ALABAMA

March 1990
CWIS #87617

B

SYLLABUS

This report provides the results of a study to determine the economic justification and environmental feasibility of modifying the Fort Gaines Channel an existing Federal navigation project, which is locally known as the Government Cut Channel. The study was conducted under the Continuing Authority Program of Section 107 of the River and Harbor Act of 1960, as amended. The objectives of the study were to evaluate navigation and related problems in the Government Cut Channel at Dauphin Island, Alabama and to examine actions that could be taken to modify and improve the channel.

The authorized channel is 4 feet deep, 40 feet wide and 4,070 feet long. It originates at an anchorage basin at Billy Goat Hole and extends northeast to the existing 7-foot Dauphin Island Bay Channel in the vicinity of Pass Drury. The channel is located on the east end of Dauphin Island, Alabama. The project was authorized by the River and Harbors Act of 2 March 1945, (House Document 333, 76th Congress, 1st Session), and 3 September 1954, (House Document 394, 82nd Congress, 2nd Session). The existing project was completed to the authorized dimensions in July 1959.

The principal difficulties now confronting navigation on the Government Cut Channel stem mainly from inadequate navigation depths for current vessel needs. The channel normally has an annual shoaling rate of about 1,120 cubic yards per year. However, when Hurricane Frederic opened Pass Drury in 1979, the shoaling rate increased significantly and the authorized channel depth availability was reduced to depths of about 2 feet mean lower low water between maintenance dredging cycles.

(cont'd p 2)

The recommended plan provides for deepening the existing channel to 6 feet plus 2 feet advance maintenance dredging and 1-foot allowable overdepth. The new work dredged material would be approximately 17,258 cubic yards of sandy material and would be disposed of on a beach nourishment site located on Dauphin Island. The designated disposal area extends from the jetty located at the Fort Gaines Channel entrance to a point on Little Dauphin Island 6,070 feet north of the jetties at the channel entrance and 150 feet into the water.

Construction of the recommended plan is estimated to cost $143 200. Of this amount the Federal cost would be $114,600 and the non-Federal cost would be $28,600. The plan has an average annual cost of $19,000 and benefits of $20,000 which provide a benefit-to-cost ratio of 1.1. Costs and benefits are based on October 1989 prices.

Local officials of the City of Dauphin Island support the recommended plan. Their support for the recommended plan was expressed in several meetings and documented in correspondance to the Mobile District. The Mobile County Commission is the non-Federal sponsor. Project financing will be provided through the General Operating Funds which have been dedicated to this purpose.

DETAILED PROJECT REPORT
FORT GAINES CHANNEL
(GOVERNMENT CUT)
DAUPHIN ISLAND, ALABAMA

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INTRODUCTION

GENERAL

This report is in response to a resolution dated 25 January 1988 adopted by the Mobile County Commission. The commission requested assistance with deepening the 4 by 40-foot Fort Gaines Channel locally known as the "Government Cut Channel" here and after will be so-called. A copy of the resolution is provided in Appendix B. A preliminary report was prepared in September 1988, which indicated the need for additional studies. After funds and manpower became available in October 1988, the Mobile District held a public workshop with officials and citizens of Dauphin Island to inform them that a feasibility phase study and preparation of a Detailed Project Report was being initiated, and to request their input into the study.

STUDY AUTHORITY

The Congress of the United States has delegated Continuing Authority through Section 107 of the River and Harbor Act of 1960, as amended, to the Secretary of the Army acting through the Chief of Engineers to study, adopt, and construct small navigation projects that have not been specifically authorized by Congress. The Section 107 authority, as amended, provides that up to $4 million of Federal funds can be expended to solve a navigation problem. This Federal cost limitation includes all project related costs for investigations, inspections, engineering, preparation of plans and specifications, supervision and administration, and construction management.

PURPOSE AND SCOPE OF INVESTIGATION FOR THIS STUDY

This report examines the feasibility of deepening the existing Federal channel from 4 feet to approximately 8 feet (exclusive of advanced maintenance and overdepth dredging). The scope of investigations presented herein pertain to providing navigation measures on the Government Cut Channel at Dauphin Island, Alabama. This report will be the decision document for which funding and construction of any feasible recommendation will be based. Investigations made for this study include the following:

a. These investigations included engineering, environmental and economic analysis and field investigations to determine the shoaling and siltation rates as well as surveys to determine channel bathometry.

b. Hydrologic and hydraulic studies were performed to determine the existing shoaling rates.

c. The U. S. Department of Interior, Fish and Wildlife Service provided a Fish and Wildlife Coordination Act Report. A copy is in Appendix B.

d. Cultural resources evaluations were performed to ensure that construction related activities would not affect significant cultural properties.

EXISTING FEDERAL PROJECT

The Government Cut Channel is located on the east end of Dauphin Island between the Fort Gaines Channel anchorage basin known as "Billy Goat Hole"and Dauphin Island Bay. The authorized channel is 4-feet deep by 40-feet wide by 4,070-feet long. The channel normally has an annual shoaling rate of about 1,120 cubic yards per year. However, subsequent to the opening of Pass Drury (located on the northeast end of Dauphin Island), as a result of Hurricane Frederic in 1979, the shoaling rate increased

significantly and the availability of authorized channel depth was reduced. The channel depth in the Government Cut was about 2-feet mean lower low water (MLLW). Pass Drury was closed in the Spring of 1989 by the Mobile District, under an operation and maintenance action, and the shoaling rate is expected to return to the approximately 1,120 cu. yds/yr previously experienced prior to the opening of Pass Drury by Hurricane Frederic. The Government Cut Channel provides a short route to the Gulf of Mexico and to the Mississippi Sound for recreation, commercial and fishing vessels departing from the west side of Dauphin Island Bay or elsewhere within the bay.

STUDY AREA

Geographic Location. The Government Cut Channel is located on the east end of Dauphin Island between an anchorage basin, called Billy Goat Hole and Dauphin Island Bay at Dauphin Island, Alabama in south Mobile County. The geographic location of the study area is shown on Figure 1 and all features in the specific study area are shown in Figure 2.

STUDY PARTICIPANTS AND COORDINATION

The Mayor of Dauphin Island, the City Council, County Officials and the citizens who reside in the project area have been the primary leaders in review and coordination of the study effort. Continuing coordination has been maintained with the Fish and Wildlife Service, National Park Service, Alabama Historic Commissison, National Marine Fisheries Service, Alabama Department of Environmental Management, and the U.S. Environmental Protection Agency. The views of these agencies are contained in Section 4 of Appendix B. Public participation was accomplished through public meetings, public workshops and public information fact sheets as presented in Section 2 of Appendix B. The report was further reviewed by the appropriate State and Federal Agencies as shown on the coordination list in Section 3 of Appendix B.

PRIOR REPORTS AND INVESTIGATIONS

There have been no other studies made in the interest of navigation on the Government Cut Channel. However, environmental documentation was recently completed for both the maintenance dredging of the channel and closure of Pass Drury which was closed during the Spring of 1989 with maintenance dredged material from the Government Cut Channel.

DESCRIPTION AND TRIBUTARY AREA

Dauphin Island is a barrier island located about 4 miles offshore of the mainland of Mobile County, Alabama, and about 22 miles south of the City of Mobile. It flanks the west side entrance to Mobile Bay and south side of the Mississippi Sound for about 14 miles. The western 10 miles is barren sand but the eastern part is heavily wooded and ranges in elevation from about 5 to 10 feet above mean sea level (MSL). Sand dunes along the Gulf side rise as high as 40 feet. Dauphin Island is connected to the mainland by a highway bridge originally completed in 1955, and reconstructed following Hurricane Frederic. This hurricane destroyed much of the development on the Island including the access bridge to the Island. The access bridge was rebuilt to elevation consistant with protection from hurricane threat in late 1983, and since that time the Island has been slowly redeveloping.

Dauphin Island Bay, about 1-3/4 miles long and 3/4 mile wide, is bounded on the south by Dauphin Island and on the north and northeast by Little Dauphin Island. The western end of the bay merges with Mississippi Sound. Natural depths in the bay average about 2 feet.

Dauphin Island is served by two Federally approved small craft navigation projects and about 5 miles of marked channels constructed by local interests, as shown on Figure 2. The Federal projects include the Dauphin Island Bay Navigation project which encompasses Government Cut Channel and anchorage area, and the Village Channel and anchorage area. Also, the larger Gulf Intracoastal Waterway main channel pass under the high rise section of Highway 163 access bridge in the Mississippi Sound.

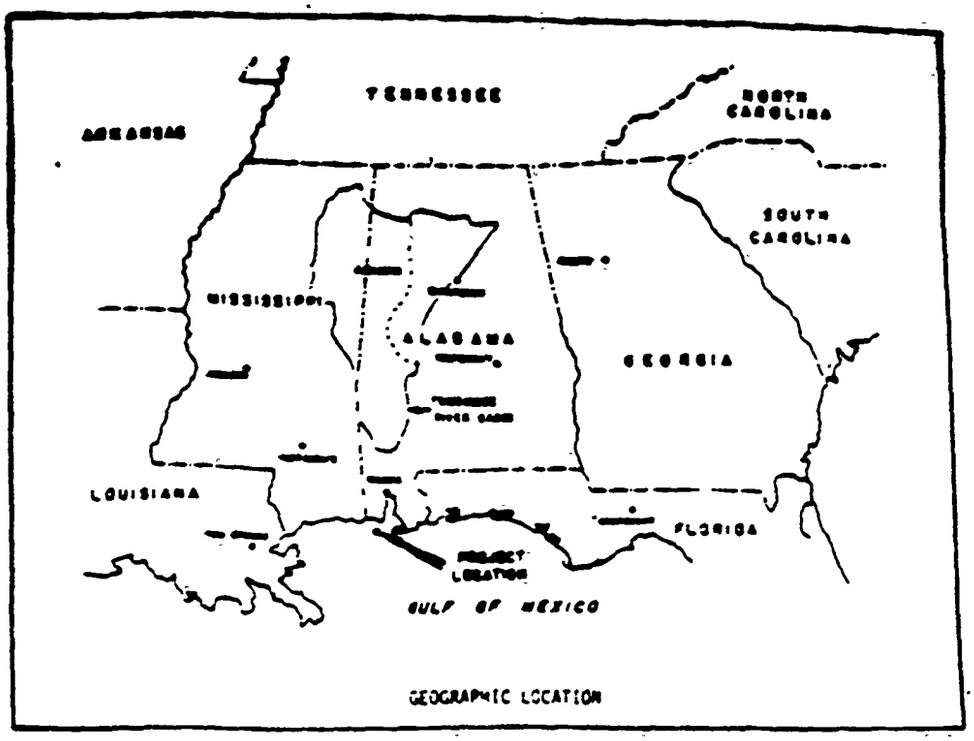

FIGURE 1

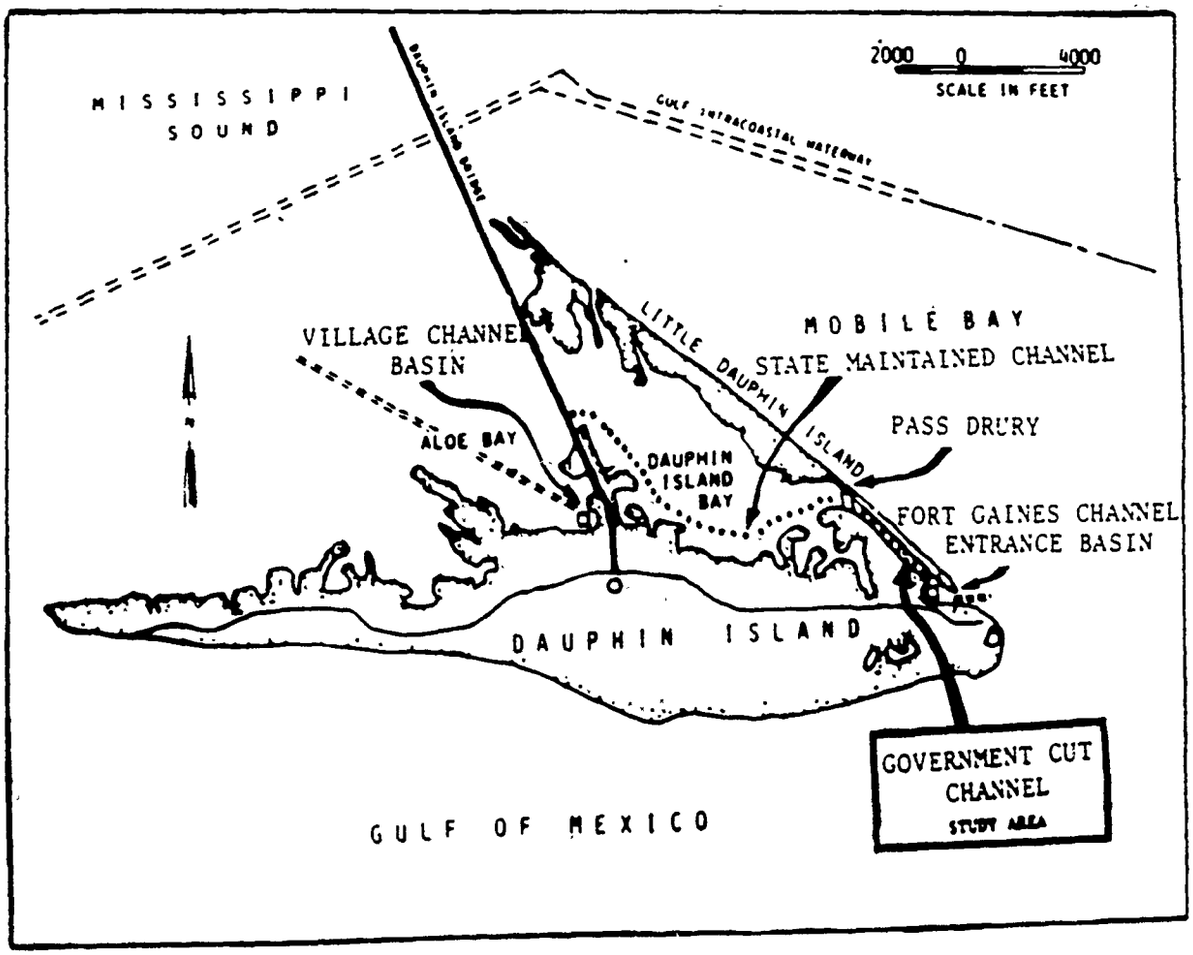

FIGURE 2

SOCIO-ECONOMIC CHARACTERISTICS

The City of Dauphin Island is located in south Mobile County, Alabama approximately 22 miles south of the City of Mobile on the Gulf of Mexico, and was incorporated in 1987. In 1980 the City had a population of 633. The average per capita income (1980 dollars) for the Island was $11,360 compared to $6,047 for Mobile County. The water related economy of the area is primarily composed of out door recreation (recreation boating and fishing); commercial fishing, and charter boat fishing. Waterborne commerce transported on the navigation channel around Dauphin Island consis almost exclussively of seafood, which is unloaded and processed at the public and private facilities on the Island. A more extensive discussion of the socio-economic aspects of the study area is presented in Appendix A.

PLAN FORMULATION

PROBLEM AND OPPORTUNITIES

Navigation Problems. The authorized 40-foot wide channel is a bottleneck which restricts commercial navigation to having drafts equal to or less than 4 feet. The channel entrance at Billy Goat Hole anchorage basin and the State Channel to the north of the Government Cut Channel are 7-foot channels. Due to the 4-foot depth constraint the Government Cut Channel is not compatible with other channels in the immediate area, and because of this, the channel is being used primarily by recreational and small commercial boaters. The vessels with drafts greater than 4-feet are being re-routed around Little Dauphin Island, a distance of approximately 9 miles to the Village Channel west of the Highway 163 bridge. The distance via Government Cut Channel would be approximately 2.5 miles, a reduction in travel distance of about 6.5 miles.

As previously mentioned, Hurricane Frederic opened Pass Drury (located on the northern end of Government Cut Channel) in 1979, the shoaling rate increased significantly and the availability of authorized channel depths

were greatly reduced with average channel depths at about 2-feet MLLW. The District recently completed maintenance dredging of the Government Cut channel and closed Pass Drury. With the closure of Pass Drury the Government Cut channel is expected to return to its previous shoaling rate. The shoaling rates for Government Cut are given in vertical feet per year and the estimated time between dredging intervals are shown in Table 1. A graphic display of the shoaling rates are shown in Figure 3.

TABLE 1

Vertical Shoaling Rate

TIME (YR)	SHOAL RATE (CY/YR)	AVERAGE SHOAL DEPTH (FT)
1	1120	.18
2	2240	.36
3	3360	.54
4	4480	.71
5	5600	.87
6	6720	1.03
7	7840	1.19
8	8960	1.35
9	10080	1.50
10	11200	1.65
11	12320	1.80
12	13440	1.95
13	14560	2.09
14	15680	2.23
15	16800	2.37
16	17920	2.50
17	19040	2.64
18	20160	2.77
19	21280	2.90
20	22400	3.03

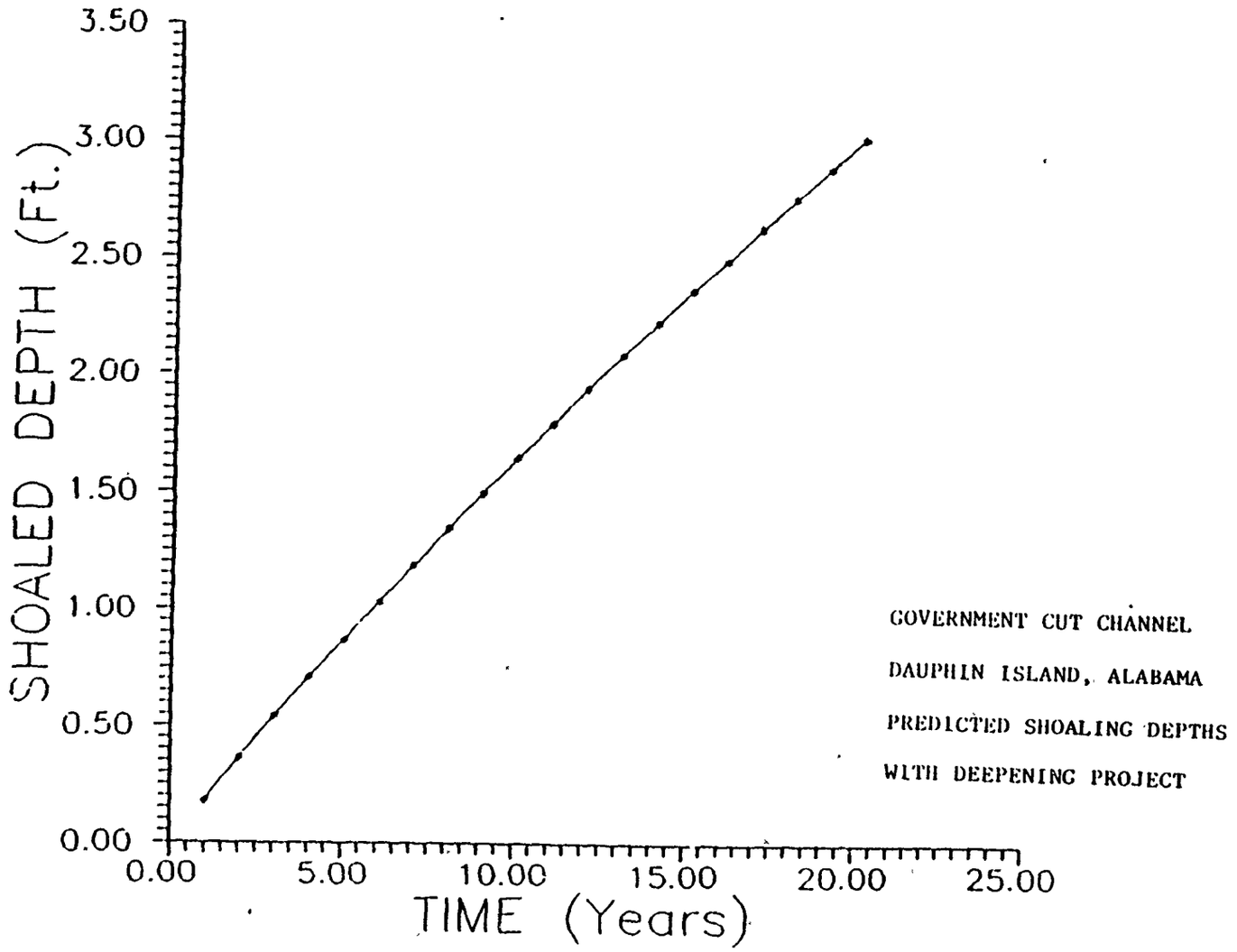
SHOALED DEPTH (Ft.)
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
5.00
10.00
15.00
20.00
25.00
TIME (Years)
GOVERNMENT CUT CHANNEL
DAUPHIN ISLAND, ALABAMA
PREDICTED SHOALING DEPTHS
WITH DEEPENING PROJECT

Figure 3

Improvements Desired. In December 1988, representatives of the Mobile District met with officials and citizens of Dauphin Island to discuss the study, the possibility of deepening the Government Cut channel, the Water Resources Development Act of 1986, and local sponsorship requirements. As a result of this meeting and other informal contacts, it was determined that property owners on the Island desired a deeper channel to accommodate larger commercial, charter and recreational vessels.

Future Without Project. The conditions of the channel will continue as a 4-foot depth restriction and probably continue to shoal in the future. Because of the incompatible channel depth, the project area is likely to continue to experience operating inefficiencies in the commercial fishing industry. Over 405 commercial and recreational vessels can navigate through the low rise section of the Highway 163 bridge and would use the project route under the without project condition if there was adequate channel depth. Inadequate channel depths in the area have contributed to the slow growth in the area.

Specific Opportunities. The with project condition would provide for more efficient (less costly) commercial navigation through increased use of the channel by vessels with drafts greater than 4-feet. With a deeper channel, potential growth in the commercial and recreational fishing industry could be realized.

STUDY OBJECTIVES

The objectives selected to guide the planning process during plan formulation for Government Cut Channel are listed below:

a. Reduce shoaling rate;

b. Maintain and enhance the integrity of the local economy;

c. Maintain and increase the quantity and/or quality of fish and wildlife habitat;

d. Contribute to outdoor recreation opportunities consistent with local needs and financial limitations;

e. Reduce health hazards due to storm surge by providing access to the Dauphin Island Bay for crafts with drafts greater than 4 feet; and,

f. Minimize the cost of operational inefficiecnies to commercial navigation due to insufficient channel depths.

PLANNING CONSTRAINTS

The Section 107 authority contains a maximum Federal expenditure limit of $4,000,000. In addition, navigation improvement plans were formulated and evaluated under technical criteria for engineering, economic and environmental constraints as follows:

a. All plans must have net National Economic Development benefits unless the deficiency is the result of benefits foregone or additional costs incurred to contribute to protection of environmental quality;

b. Improvement works must be capable of being constructed and must be designed for the project life,

c. Each seperable element of an alternative plan must provide benefits at least equal to its cost;

d. Annual benefits and costs are based on a 50-year project life and the current interest rate for Federal projects (8-7/8 percent) for the selected plan during plan formulation;

e. The recommended Plan must have a benefit to cost ratio greater than 1 using commercial navigation benefits and recreational benefits capped at the amount of the commercial; and,

f. The recommended Plan must be compatible with development plans of the City of Dauphin Island.

ALTERNATIVES CONSIDERED

Based on characteristics of the study area and concerns expressed by the citizens of the area, 4 alternative plans were developed for consideration. The Government Cut channel, an existing project at 4-feet MLLW, was analyzed with incremental increase in available depth as an alternative route for vessels that are re-routing around Dauphin Island under the without project condition.

Development of Alternatives. Four alternative channel depths were considered to provide access through the Government Cut channel. The channel depths analyzed were 5, 6, 7, and 8-foot plus 2-foot advanced maintenance and a 1-foot allowable overdepth. Each of the alternative channel plans have a 40-foot bottom width (No increase in width over existing conditions). The benefits to each of the alternatives are based on the vessels ability to navigate the deepened channel (consideration was given to the use of high tides) and thus resulted in a reduction of the variable operating costs of having to re-route around Little Dauphin Island.

Summary of Alternatives. A summary of benefits and costs involved with each of the four alternative plans considered are shown in Table 2. All plans are based on October 1989 prices, with 8-7/8 percent interest and include an $6,000 annual charge for operation and maintenance of the project. The plans include dredging 2-feet of advanced maintenance and 1-foot of overdepth.

TABLE 2

Plan Formulation Feasibility Summary

Plan	Nav. Depth Ft. MLLW	Annual Benefits ($1000)	Annual Costs ($1000)	Net Benefits ($1000)	B/CR
1	5'+2'+1'	15.3	17.3	-2.0	0.9
2	6'+2'+1'	20.0	19.0	1.0	1.1
3	7'+2'+1'	20.4	20.3	0.1	1.0
4	8'+2'+1'	20.4	21.2	-0.8	0.9

PLAN SELECTION

Each of the 4 plans investigated for the Channel would be fully implementable from an engineering, environmental and economic point of view. During initial plan formulation, it was determined that Plan 2 provided more net economic benefits and at a lesser cost. The plan would provide for a 6-foot channel with 2-foot for advanced maintenance and 1-foot for allowable overdepth. This would provide for a channel that would be more in line with other channel depths in the vicinity and would cost less than plan 3. Therefore, Plan 2 is identified as the NED plan and is selected for further detailed design and implementation.

THE NED PLAN

DESCRIPTION

The NED Plan would provide an improved channel beginning at the 7-foot Billy Goat Hole anchorage basin and extending upstream 4,070-feet to the intersection with the 7-foot Dauphin Island Bay (State Maintained) channel. The channel would be dredged to 6-foot with 2-foot for advance maintenance and 1-foot for overdepth. The channel would also be maintained at the existing 40-foot bottom width with a 1 vertical to 3 horizontal side slope. The dredging work would be accomplished from within the channel. Pending availability of project funds, this work would be accomplished during winter months when aquatic resources spawning activities are low. The material would be dredged by hydraulic pipeline dredge and pumped to the primary disposal site along the east side of Dauphin Island and a portion of Little Dauphin Island. A secondary disposal site located at the southeast tip of Dauphin Island adjacent to Fort Gaines would be used as needed. The dredged material will be placed on the island to mimic the existing topography. The primary disposal site extends from the jetties located at the entrance to Fort Gaines Channel to a point on Little Dauphin Island about 6,070-feet north and 150-feet into the water. This material will provide for beach nourishment (no additional cost sharing required as this is the least costly alternative) along the bayside water front, and afford some shoreline protection for the area. Both disposal sites have been previously used and are currently approved for routine maintenance of the project. Refer to Plate No. 1 for disposal site locations.

MITIGATION MEASURES

As detailed plan formulation for the NED Plan proceeded, consideration was given to the need for mitigation measures. The evaluation of the NED Plan found no significant impacts that warranted mitigation measures. This is due largely to disposing of dredged material along eroding shoreline previously used for disposal areas. As defined in the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA), "mitigation" includes: (a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; (e) compensating for the impacts by replacing or providing substitute resources or environments (40 CFR Parts 1500-1508).

BENEFITS

The method for evaluating economic benefits is consistent with the Water Resource Council's Principles and Guidelines (P&G) and Corps of Engineers regulation ER 1105-2-40. Benefits to which quantifiable monetary values can be assigned are tangibles benefits. The benefits from modifying the Government Cut Channel are attributable to the comparable economic advantage of the "with-project" over the "without-project" conditions. The benefit evaluation primarily focused on the means of reducing or eliminating routing costs due to inadequate depths. This was done by re-routing the vessels that would use the project verses routing the vessels by the next least costly route. The costs were based on hourly varible operating costs of the vessels by draft and travel time. The per trip cost was multiplied by the number of trips to determine the annual variable operating cost of the trips routed each way. During the investigation it was determined that over 400 vessels have the ability to navigate the channel and would use the shorter route. The benefits that would accrue by having access to the shorter route would be $20,000 with a channel depth of 6-feet.

COST ESTIMATE

Table 3 presents project costs for the NED Plan and provides the basis for establishing the appropriate level of non-Federal cost sharing interests. Cost sharing for a Section 107 project requires that the non-Federal sponsor provide a cash contribution during construction and all lands, easements and rights-of-way.

TABLE 3

Detailed Cost Estimate
(October 1989 Prices and 8-7/8 percent interest)

Code	Item	Quanity	Unit	Unit Cost	Total Cost
12.	Channel Work				
12.	Channel Dredging	17,258	CY	$ 1.12	$19,300
12.0.A.	Mob. And Demob. Costs	1	Job	40,000	40,000
	Contingencies (15%)				8,900
	Total Construction Cost				68,200
30.	Planning, Engineering and Design				55,000
31.	Construction Management				20,000
	Total for Channel Work				$143,200
01.	Lands and Damages				
12.0.1.	Disposal Area	0	Ac	0	0 1/
01.J.1	Dike Construction	0	CY	0	0 1/
01.M	LERR	0	Ac	0	0 1/
	TOTAL PROJECT FIRST COST				$143,200

1/ All construction work will be accomplished in the existing ROW limits, and disposal will be accomplished on existing dredge disposal land at no cost to the non-Federal sponsor.

OPERATION AND MAINTENANCE

It would be the responsibility of the Federal Government to operate and maintain all features of the project. It is expected that occasional dredging would be required due to wind blown sand and sloughing from prop wash. Occasional shoaling is expected at the north end of the channel in the vicinity of the former Pass Drury. It is expected that the shoaling rate will return to pre-Pass Drury condition. The estimated average annual operation and maintenance cost would be about $6,000 per year. Periodic inspections would be made of the project area by the District Engineer or his representative, and a report would be made noting any deficiencies in maintenance.

INVESTMENT COSTS AND ANNUAL CHARGES

The estimated investment cost and annual charges for the NED Plan is shown in Table 4. Interest during construction is based on a 3-month period and 8-7/8 percent.

TABLE 4

Investment Costs Annual Charges and Feasibility Summary For The NED PLAN
(Oct 89 Prices, 8-7/8% Interest Rate, 50-Year Life)

Item Description	Cost
INVESTMENT COST	
Total Project First Cost	$ 143,200
Interest During Construction	1,600
TOTAL PROJECT INVESTMENT COST	$ 144,800
ANNUAL CHARGES	
Interest	12,800
Amortization	200
Operation and Maintenance	6,000
TOTAL PROJECT ANNUAL CHARGES	$ 19,000
FEASIBILITY	
Annual Benefits	$20,000
Annual Costs	$19,000
Net Benefits	$ 1,000
Benefit-to-Cost Ratio	1.1

ENVIRONMENTAL COMPLIANCE

The evaluation of the environmental impacts found that no significant adverse effects would result from implementation of the NED Plan. The limited scope of work and the lack of significant adverse environmental impacts does not justify the preparation of an Environmental Impact Statement (EIS). An Environmental Assessment (EA) was prepared and is included in this report. Appropriate Federal and State agencies and local interests were consulted during the preparation of the environmental assessment. The Fish and Wildlife Coordination Act Report is provided in Appendix B. The NED Plan would require placement of dredged material in waters of the United States. Therefore, a Section 404(b)(1) evaluation, as defined under the Clean Water Act, was prepared and is included in the Environmental Assessment section of this report. Coordination efforts with the National Marine Fisheries Service, Alabama Historic Commission are included in Section 4 of Appendix B. Coordination with other Federal and State Agencies are shown on the coordination list in Section 3 of Appendix B.

COST APPORTIONMENT

In general, the cost for engineering, design, specifications and construction would be shared by the Federal government and the non-Federal sponsor, while the cost for operation and maintenance would be borne entirely by the Federal Government.

The non-Federal sponsor would be required to provide 10 percent of the cost of construction of that portion of the project with depth less than 20 feet. In addition, the sponsor is required to provide another 10 percent of the cost of the general navigation features of the project in cash over a period not to exceed 30 years at an interest rate determined pursuant to Section 106 of WRDA, 1986. The value of all lands, easements, rights-of-way, relocations and dredged material disposal (LERRD) shall be credited toward the 30-year payment. However, since additional LERR are

not required for project construction and dredged material is to be disposed in existing disposal sites, the sponsor would be required to pay in cash an amount equal to 20 percent of the general navigation features. Annual operation and maintenance of the project after implementation would be provided by the Federal Government. Based on these conditions the non-Federal cost would be $28,600 with a Federal cost of $114,600 as shown in Table 5.

TABLE 5

Cost Apportionment ($1,000)

ITEM	FEDERAL	NON-FEDERAL	TOTAL
GNF			
Project Construction	$114.6	$28.6	$143.2
Habitat Mitigation	0	0	0
Navigation Aids	0	0	0
LERRD			
Lands and Damages	0	0	0 1/
Subtotal	114.6	28.6	143.2
percentages	80	20	100
TOT. PROJ. FIRST COST	$114.6	$28.6	143:2

1/ No additional LERR is required for project construction and the dredged material will be disposed in the existing disposal sites. Therefore, the non-Federal share would be 10 percent cash contribution up front with an additional 10 percent over time, but not exceed 30-years for the navigation features. Resulting in 20 percent of the total project cost.

PLAN IMPLEMENTATION

INSTITUTIONAL REQUIREMENTS

Submission of a draft and final feasibility report by the District Engineer and review and approval by SAD, HQUSACE and ASA-Civil Works constitute the first steps in a series of events which must take place before the project can become a reality. It may be modified at any stage of review, and only if it successfully passes all stages will the project ultimately be constructed. These events are:

a. The South Atlantic Division Engineer will provide technical approval of the engineering and design of the NED Plan;

b. The report will be forwarded to the Office of the Chief of Engineers for review of current policy and approval;

c. Funds for advanced planning and design will be allotted;

d. Detailed plans and specifications for the work will be prepared by the Mobile District and submitted to the Division Engineer for approval;

e. Upon approval of the Assistant Secretary of the Army (Civil Works) to expend funds for constructing the project, the Chief of Engineers authorizes the project;

f. Contractual agreements will be entered into with the non-Federal sponsor and the Secretary of the Army to establish responsibilities for the project. The non-Federal sponsor executes Local Cooperation Agreement;

g. Upon approval of the plans and specifications, construction funds will be provided, the project will be advertised for bids and a construction contract will be awarded by the Mobile District to the eligible low bidder; and,

h. The non-Federal sponsor will provide a cash contribution for project construction amounting to twenty percent of the total project first cost.

FEDERAL RESPONSIBILITIES

The Federal responsibilities associated with implementation of the NED plan for Government Cut Channel will be as follows:

a. Responsibility for the design and preparation of plans and specifications;

b. Construction of the project with appropriate cost sharing;

c. Operate and maintain the project in accordance with the Operation and Maintenance Manual; and,

d. Annual inspection of the completed project.

NON-FEDERAL RESPONSIBILITIES

Non-Federal sponsor responsibilities associated with implementation of the NED plan for Government Cut Channel would be as follows:

a. Provide all lands, easements, and rights-of-way determined by the Chief of Engineers to be necessary for construction of the project;

b. Provide suitable dredged material disposal areas including retaining dikes, weirs, bulkheads, and embankments as determined necessary by the Chief of Engineers for the construction, operation, and maintenance of the project;

c. Accomplish all alterations and relocations of buildings, highways, railroads, bridges, storm drains, utilities, cemetaries, and other facilities, structures and improvements necessary for the project;

d. Provide, during construction a 10 percent cash contribution of the portion of the project which has depth less than 20 feet, plus an additional 10 percent over a 30-year period less any cost for LERRD.

e. Hold and save the United States free from damages due to the construction, operation and maintenance of the project when not the fault of the United States;

f. Assume responsibility for project costs in excess of the Federal cost limitation of $4,000,000; and,

g. No less than once a year, the non-Federal sponsor shall inform affected interests of the limitations of the project depths.

FINANCIAL STATEMENT

The non-Federal sponsor has been informed of their obligation and has indicated financial capability to provide their share of the project construction cost from the General Fund of Mobile County. Sufficient funds have been set-a-side for the non-Federal share of the Government Cut project. A letter from the Commission dedicating finances for the project which include a statement of intent indicating their willingness to provide the items of local cooperation are included in Section 1 of Appendix B.

SUMMARY OF COORDINATION

On 7 December 1988, a public meeting was held to present preliminary findings for this study. Notices of the meeting were furnished to U.S. Senators and Representatives from the area, Federal and State agencies, city and county governments and other agencies, interested organizations and individuals. The majority of those present at the meeting were in favor of improving the channel. A summary of the meeting is presented in Section 2 of Appendix B.

REVIEW BY FEDERAL AND STATE AGENCIES

The Fish and Wildlife Service has been involved in the planning for this project. A copy of the Fish and Wildlife Coordination Act Report is contained in Section 4 of Appendix B. Additional coordination and review of draft report with concerned interests were performed and resulting comments on the plan are included in Section 4 of Appendix B. The coordination list is contained in Section 3 of Appendix B.

CONCLUSIONS

After carefully considering all technical information and public views, and with particular reference to the economic, environmental, and social well being needs in the area, I find that navigation improvements at the Government Cut Channel are needed and within the Federal interest to implement. Of the alternatives considered, Plan 2 has the highest net benefits consistent with protection of the environment, and is, therefore, designated as the NED Plan. The NED Plan is complete and effective in solving the problems and in realizing the available opportunities. The first cost of the NED plan is estimated at $143,200, and the non-Federal sponsor's share would be $28,600. The benefit-to-cost ratio is 1.1 to 1. The NED Plan is acceptable to the non-Federal sponsor, the public, and all reviewing agencies. The adverse environmental impacts of providing navigation improvements are minimal.

RECOMMENDATIONS

Therefore, it is recommended that the existing Federal navigation project "Government Cut Channel" at Dauphin Island, Alabama be modified to provide for navigation improvements and maintenance for a distance of 4,070-feet from the jetties at the Fort Gaines channel entrance to the Dauphin Island Bay. This recommendation is made with the provisions that, prior to the commencement of construction, local interests will, in addition to providing the general requirements of law for these types of projects, agree to comply with those items in the Local Cooperation Agreement for this project.

This recommendation reflects current information and policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the construction nor the perspective of higher review levels. Consequently, the recommendation maybe modified before it is approved and funded by the Chief of Engineers.

LARRY S. BONINE
for Colonel, Corps of Engineers
District Engineer

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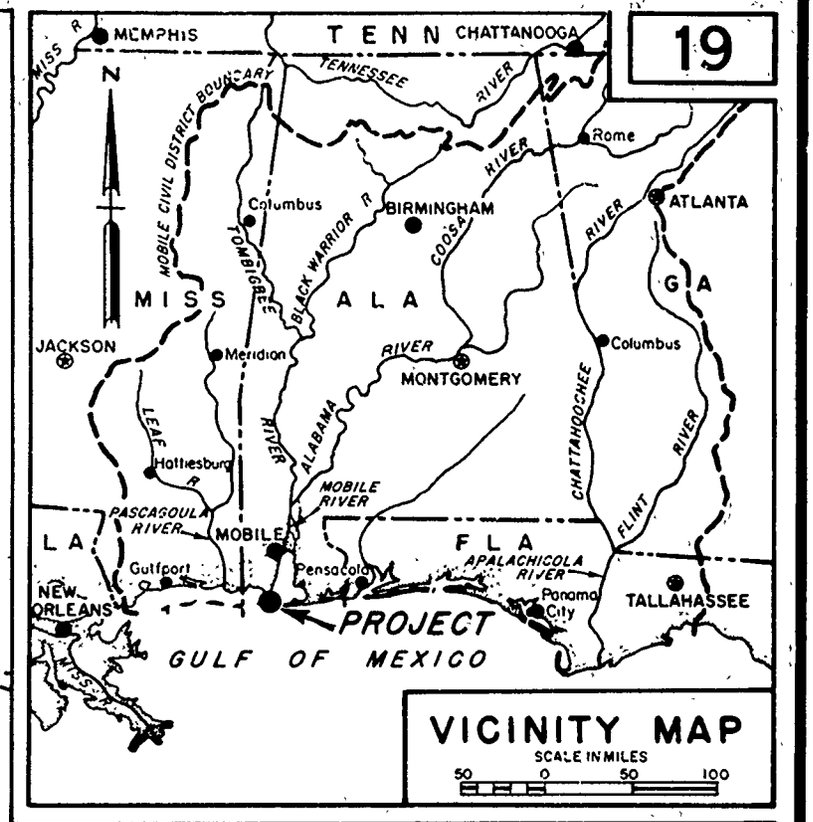
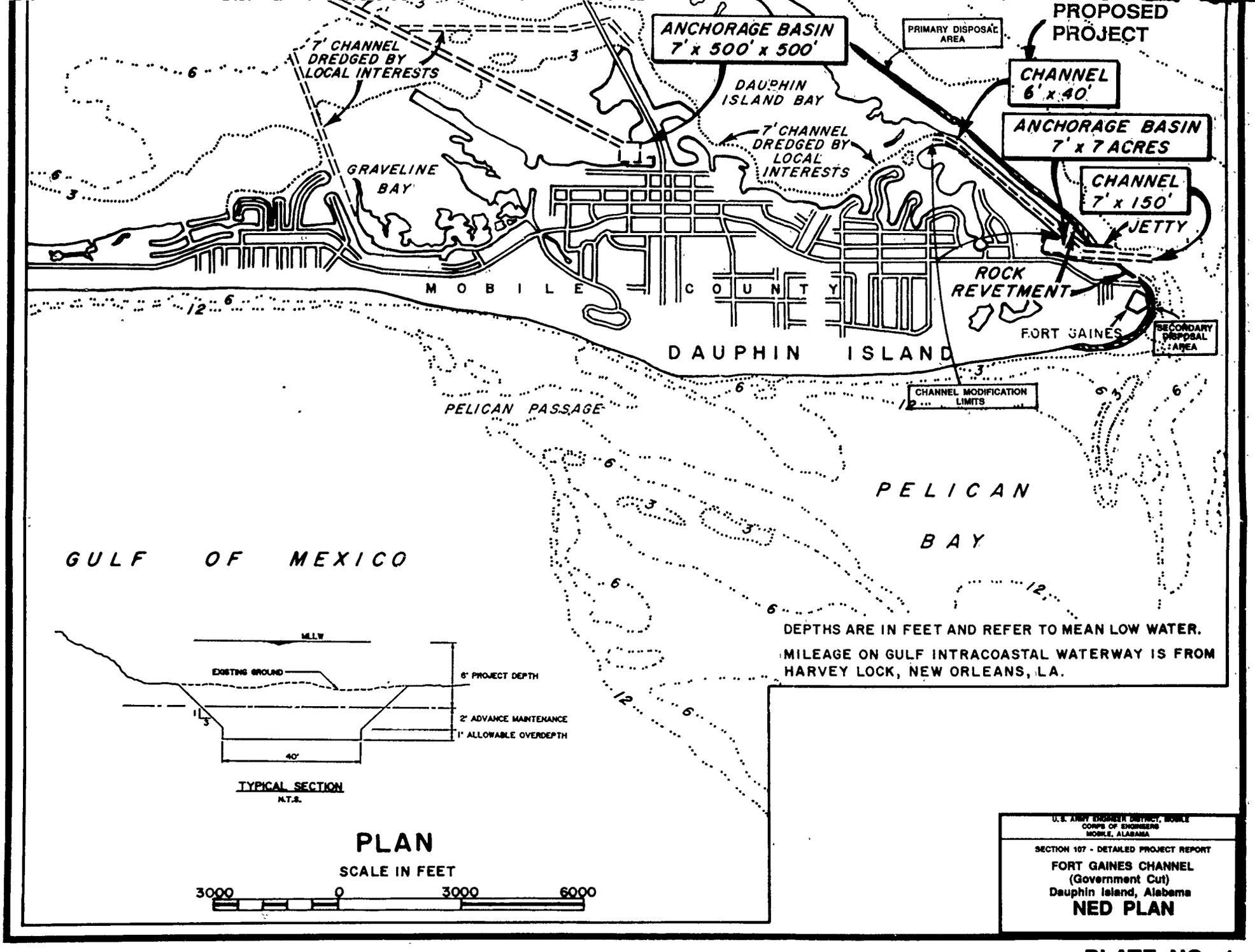

MEMPHIS
TENN
CHATTANOOGA
MISS R
TENNESSEE RIVER
MOBILE CIVIL DISTRICT BOUNDARY
Rome
TOMBIGBEE R
Columbus
BIRMINGHAM
BLACK WARRIOR R
COOSA RIVER
ATLANTA
MISS
ALA
GA
JACKSON
Meridian
MONTGOMERY
Columbus
LEAF R
Hattiesburg
ALABAMA RIVER
MOBILE RIVER
CHATTAHOOCHEE RIVER
FLINT RIVER
PASCAGOULA RIVER
MOBILE
LA
FLA
APALACHICOLA RIVER
Gulfport
Pensacola
Panama City
TALLAHASSEE
NEW ORLEANS
PROJECT
GULF OF MEXICO
VICINITY MAP
SCALE IN MILES
50 0 50 100

MOBILE BAY
CEDAR POINT
163
OYSTERS
OYSTERS
OYSTERS
MISSISSIPPI SOUND
GRANTS PASS
Mi. 129
Mi. 128
Mi. 127
Mi. 126
PASS AUX HERONS
GULF INTRACOASTAL WATERWAY
Mi. 131
MOBILE BAY
ENTRANCE CHANNEL 7' x 100'
LITTLE DAUPHIN ISLAND
PROPOSED PROJECT
ANCHORAGE BASIN 7' x 500' x 500'
PRIMARY DISPOSAL AREA
CHANNEL 6' x 40'
7' CHANNEL DREDGED BY LOCAL INTERESTS
DAUPHIN ISLAND BAY
ANCHORAGE BASIN 7' x 7 ACRES
7' CHANNEL DREDGED BY LOCAL INTERESTS
CHANNEL 7' x 150'
GRAVELINE BAY
3
6
12



U.S. ARMY ENGINEER DISTRICT, MOBILE
CORPS OF ENGINEERS
MOBILE, ALABAMA

SECTION 107 - DETAILED PROJECT REPORT

FORT GAINES CHANNEL
(Government Cut)
Dauphin Island, Alabama
NED PLAN

PLATE NO. 1

ENVIRONMENTAL ASSESSMENT

FINDING OF NO SIGNIFICANT IMPACTS

ENVIRONMENTAL ASSESSMENT
AND
SECTION 404(b)(1) EVALUATION REPORT
GOVERNMENT CUT CHANNEL
DAUPHIN ISLAND, ALABAMA

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FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR THE PROPOSED IMPROVEMENT TO THE GOVERNMENT CUT PORTION OF THE DAUPHIN ISLAND BAY NAVIGATION PROJECT DAUPHIN ISLAND, ALABAMA

I. PROPOSED ACTION. The action proposed is the improvement of the Government Cut portion of the Dauphin Island Bay navigation project. Improvements would be accomplished by the deepening of the Government Cut. The preferred depth of improvement is -6 feet mean lower low water (MLLW) plus an additional 2 feet of advanced maintenance and 1 foot of overdepth or a total improvement to -9 feet MLLW. Increasing the depth of the Government Cut to -9 feet would make the channel compatible with the Ft. Gaines Channel and turning basin and the channel maintained by the State of Alabama which is located within Dauphin Island Bay.

The proposed action would require that approximately 18,000 gross cubic yards of sand be dredged from the Government Cut by hydraulic pipeline dredge and disposed along the eastern side of Little Dauphin and Dauphin Islands for beach nourishment and shoreline protection (Figure 2). Figure 3 is a typical cross section of the Government Cut channel. The disposal plan requires placement of dredged material on the beach of Dauphin Island from the jetty located at the extreme south end of the island to a point on Little Dauphin Island 2,000 feet north of the former Pass Drury and up to 150 feet offshore. Also, continued use of the beach nourishment area is proposed for future activities in order that shoreline erosion may be reduced. An alternate disposal area at the eastern tip of Dauphin Island could be used in conjunction with the primary disposal area along Little Dauphin and Dauphin Islands. Both disposal areas are previously-used and approved disposal areas that are utilized in conjunction with the routine maintenance of the Dauphin Island Bay navigation project.

Future maintenance material dredged from the Government Cut channel would continue to be placed along the shoreline of Little Dauphin and Dauphin Islands and at the eastern tip of Dauphin Island adjacent to Ft. Gaines. Annual maintenance quantities are estimated to be approximately 2,000 gross cubic yards.

II. ALTERNATIVES CONSIDERED.

a. No action
b. Improvement of the Government Cut channel to varying channel depths

III. FACTORS CONSIDERED IN THE DETERMINATION THAT NO ENVIRONMENTAL IMPACT STATEMENT IS REQUIRED.

All impacts which would occur as a result of the improvement of the Government Cut portion of the Dauphin Island Bay navigation project, Dauphin Island, Alabama, have been determined to be minor, short term impacts. Adverse impacts associated with the proposed action include benthic destruction, esthetic degradation during dredging, increased turbidity and suspended particulates, increased noise levels during dredging, and potential salinity changes within Dauphin Island Bay as a result of the deepened channel.

Beneficial impacts associated with the proposed improvement consist of the provision of reliable navigation between Ft. Gaines Channel and Dauphin Island Bay, shoreline protection, protection of the Government Cut portion of the Dauphin Island Bay navigation project, and increased shorebird habitat.

No endangered or threatened species, cultural resources or wetlands would be impacted by the action. Water quality certification and a statement of coastal zone consistency have not been requested, and no problems are anticipated which would preclude their receipt. Additionally, the proposed action has been reviewed by the Department of the Interior under the Coastal Barrier Resources Act and deemed consistent with the objectives of the Act.

IV. CONCLUSIONS. An evaluation of the environmental assessment for the Government Cut portion of the Dauphin Island Bay navigation project, Dauphin Island, Alabama, which describes the proposed improvement and its effects, shows that the proposed improvement to the Government Cut would have no significant impacts and the preparation of an environmental impact statement is not required.

DATE: 7 Mar 90

LARRY S. BONINE
Colonel, Corps of Engineers
District Engineer

ENVIRONMENTAL ASSESSMENT
FOR THE
IMPROVEMENT TO THE
GOVERNMENT CUT PORTION OF THE
DAUPHIN ISLAND BAY NAVIGATION PROJECT
DAUPHIN ISLAND, ALABAMA

A FEDERALLY AUTHORIZED PROJECT

1. EXISTING PROJECT DESCRIPTION. The existing Dauphin Island Bay, Alabama, navigation project provides for: 1) a channel 7 feet deep and 150 feet wide from Mobile Bay to an anchorage basin of the same depth, about seven acres in area, located just north of Fort Gaines on Dauphin Island (Ft. Gaines Channel); a channel 4 feet deep and 40 feet wide from the anchorage basin to Dauphin Island Bay (Government Cut); and a jetty and revetment to protect the entrance channel; and, 2) an anchorage basin 7 feet deep and 500 feet square at Dauphin Island village (Village Channel), with an entrance channel of like depth, 100 feet wide and about 8,300 feet long, extending to the 7-foot hydrographic contour in Mississippi Sound (U.S. Army Engineer District, Mobile, 1985 and Figure 1).

2. PROJECT AUTHORIZATION. The existing project was authorized by the River and Harbors Acts of 2 March 1945 (House Document 333, 76th Congress, 1st Session), and 3 September 1954 (House Document 394, 82nd Congress, 2nd Session). The project was completed in July 1959.

3. ENVIRONMENTAL DOCUMENTATION. The Dauphin Island Bay navigation project was the subject of an environmental impact statement which was filed with the President's Council on Environmental Quality (CEQ) on 9 December 1974. In July 1979, an environmental assessment was prepared for the use of the segment of Dauphin Island below Pass Drury for the construction of an upland disposal area. In November 1985, an environmental assessment was prepared concerning the use of the east end of Dauphin Island near Ft. Gaines as a disposal area in conjunction with the post-Hurricane Elena dredging of the Dauphin Island Bay project. In April 1987, a supplement to the 1985 environmental assessment was prepared for the purpose of using the east side of Dauphin Island below Pass Drury as a beach nourishment disposal area in connection with the dredging of the Government Cut portion of the Dauphin Island Bay project. The April 1987 action was an effort to temporarily restore navigation to that channel which theoretically shoals as a result of sediment movement through Pass Drury. In August 1988, an environmental assessment was prepared for the closure of Pass Drury in connection with the maintenance of the Government Cut portion of the navigation project.

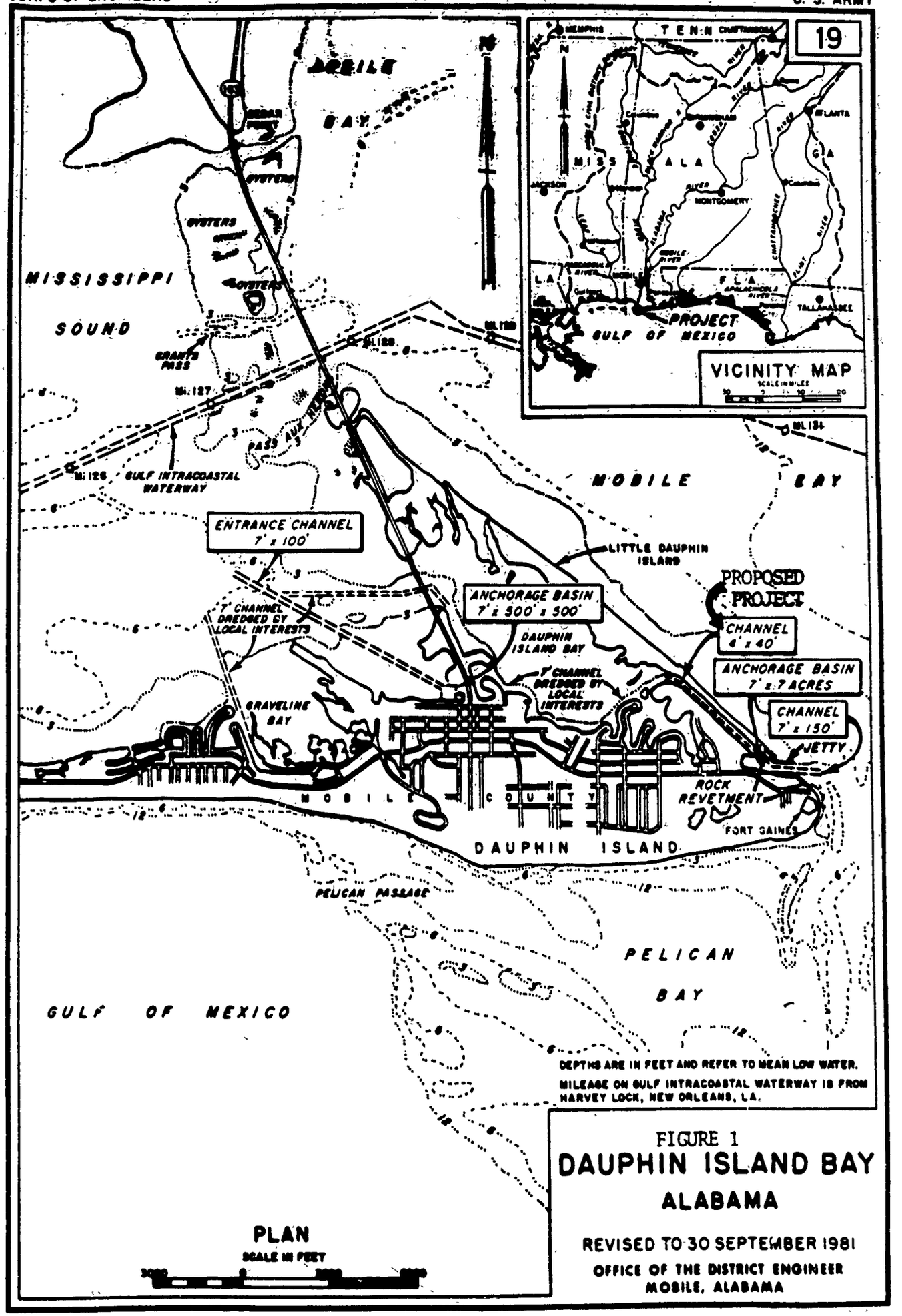

FIGURE 1

DAUPHIN ISLAND BAY
ALABAMA

REVISED TO 30 SEPTEMBER 1981

OFFICE OF THE DISTRICT ENGINEER
MOBILE, ALABAMA

4. PROPOSED ACTION. The action proposed is the improvement of the Government Cut portion of the Dauphin Island Bay navigation project. Improvements would be accomplished by the deepening of the Government Cut. The proposed depth of improvement is -6 feet mean lower low water (MLLW) plus an additional 2 feet of advanced maintenance and 1 foot of overdepth or a total improvement to -9 feet MLLW. Increasing the depth of the Government Cut to -9 feet would make the channel compatible with the Ft. Gaines Channel and turning basin and the channel maintained by the State of Alabama which is located within Dauphin Island Bay.

The proposed action would require that approximately 18,000 gross cubic yards of sand be dredged from the Government Cut by hydraulic pipeline dredge and disposed along the eastern side of Little Dauphin and Dauphin Islands for beach nourishment and shoreline protection (Figure 2). Figure 3 is a typical cross section of the Government Cut channel. The disposal plan requires placement of dredged material on the beach of Dauphin Island from the jetty located at the extreme south end of the island to a point on Little Dauphin Island 2,000 feet north of the former Pass Drury and up to 150 feet offshore. Also, continued use of the beach nourishment area is proposed for future activities in order that shoreline erosion may be reduced. An alternate disposal area at the eastern tip of Dauphin Island could be used in conjunction with the primary disposal area along Little Dauphin and Dauphin Islands. Both disposal areas are previously-used and approved disposal areas that are utilized in conjunction with the routine maintenance of the Dauphin Island Bay navigation project.

Future maintenance material dredged from the Government Cut channel would continue to be placed along the shoreline of Little Dauphin and Dauphin Islands and at the eastern tip of Dauphin Island adjacent to Ft. Gaines. Annual maintenance quantities are estimated to be approximately 2,000 gross cubic yards.

5. NEED FOR THE PROPOSED ACTION. The need for the proposed action is to provide for reliable navigation for commercial and residential boaters of Dauphin Island and vicinity. The improvement would make the Government Cut channel compatible with adjoining channels.

6. ENVIRONMENTAL IMPACTS. The proposed deepening of the Government Cut and use of the existing beach nourishment disposal area would involve both adverse and beneficial impacts to the project area. Immediate, short-term adverse impacts include, but are not limited to, benthic destruction, reduced esthetic values, increased turbidity, increased noise, and wildlife disturbance (aquatic and terrestrial). Long-term impacts would include, but not be limited to, minor changes in salinity within the bay and esthetic and noise impacts due to increased vessel traffic in the Government Cut. The beneficial impacts consist of increased reliable navigation through the Government Cut, shoreline protection, protection of the Little Dauphin Island segment of the U.S.

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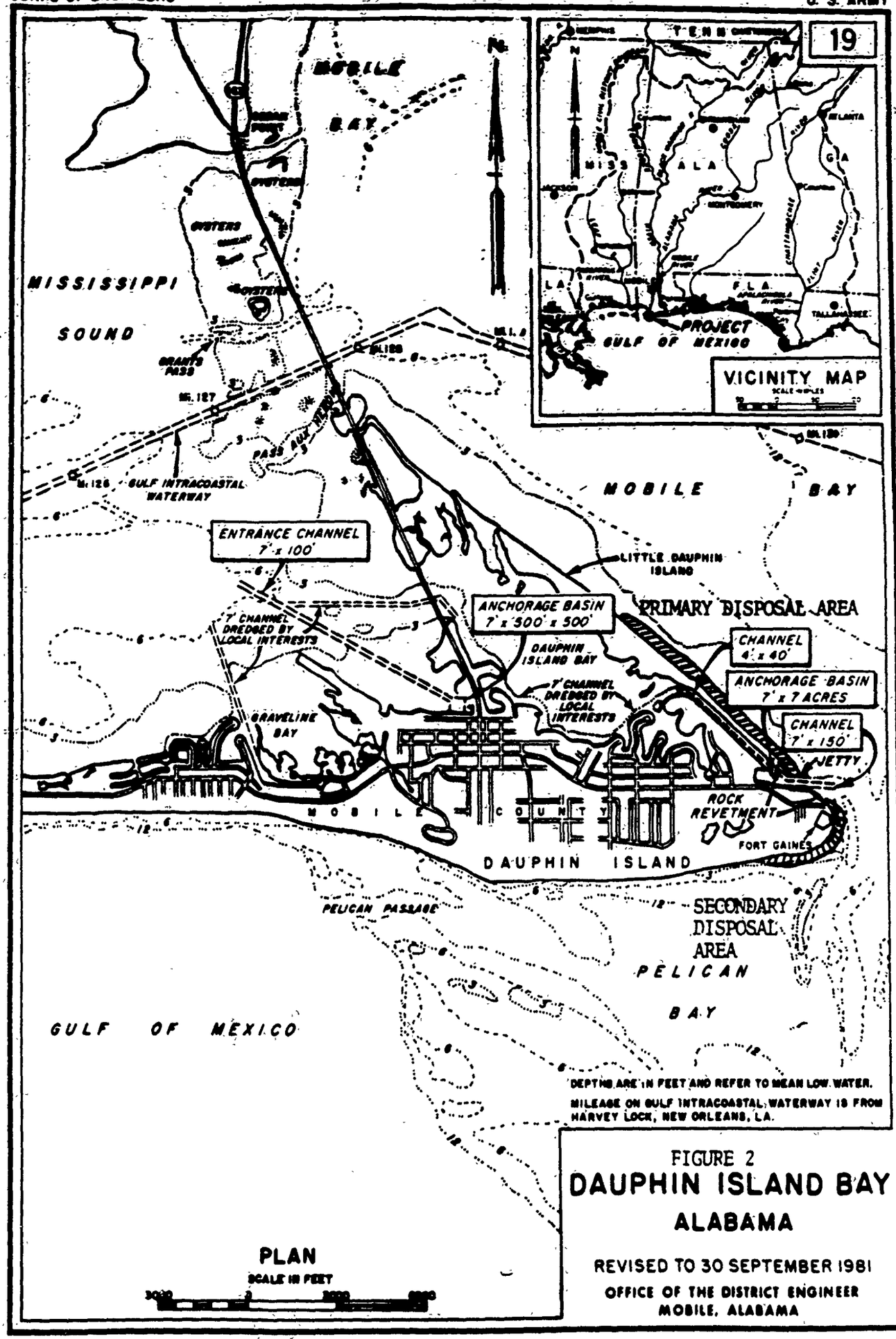


FIGURE 2

DAUPHIN ISLAND BAY

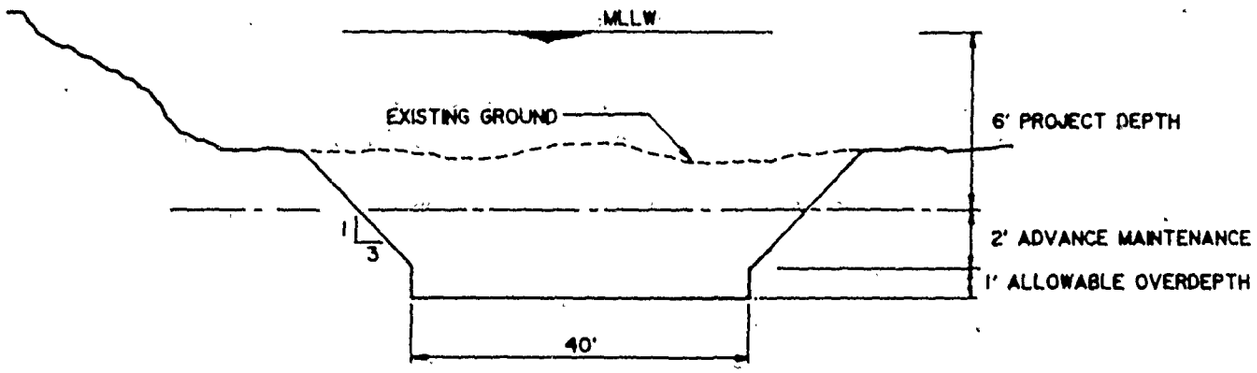
ALABAMA

REVISED TO 30 SEPTEMBER 1981

OFFICE OF THE DISTRICT ENGINEER
MOBILE, ALABAMA

FIGURE 3

GOVERNMENT CUT CHANNEL
DAUPHIN ISLAND, ALABAMA
TYPICAL CHANNEL CROSS SECTION



TYPICAL SECTION
N.T.S.

Department of the Interior, Bon Secour National Wildlife Refuge, protection of the Government Cut portion of the existing Federally authorized navigation project, and development of shorebird habitat.

a. **Adverse impact.**

1) Benthos. Adverse impact to benthic organisms would occur as a result of the direct placement of dredged material on the beach of Little Dauphin and Dauphin Islands and around the eastern tip of Dauphin Island. While most of the benthic organisms in these areas are quite adaptable to these changes, destruction of benthic organisms would occur as a result of the direct placement of sand in the shallow water adjacent to the beach. It is expected that the beach areas below mean low water would be rapidly repopulated with benthic organisms.

2) Esthetics. Reduction in esthetic qualities will occur as a result of the presence of the dredge, discharge pipeline and other associated equipment during the dredging operation. This impact is typically a minor, short-term impact. A long term aesthetic impact to property owners facing the channel may also be realized by the improvement of the Government Cut due to the increased vessel traffic in the project area. Many of the vessels that previously utilized the Pass aux Herons would utilize the Government Cut for ingress/egress to Mobile Bay.

3) Turbidity. Increased turbidity will be noticeable during the disposal of the dredged material. This impact is caused by the resuspension of the silt component of the material being dredged. Generally, the material to be disposed is a medium grade sand. The turbidity levels will be increased only for a short time during the disposal phase of the operation and will return to predisposal levels after placement is completed.

4) Noise. Noise will increase during the operation as a result of the operation of the dredge and associated equipment and will cease after dredging is completed. A minor long-term noise impact may also accompany the improvement as a result of increased use of the channel by boaters.

5) Salinity. The potential for changes in salinity regimes in Dauphin Island Bay may exist with the deepening of the Government Cut; however, examination of the modeling information presented in the Mississippi Sound and Adjacent Areas Dredged Material Disposal Study (U.S. Army Corps of Engineers, 1984) suggests that salinity patterns should not be significantly affected as a result of the action.

b. **Beneficial impacts.**

1) Provision of Reliable Navigation between Ft. Gaines Channel and Dauphin Island Bay. Presently the Government Cut acts as a plug for vessels of draft greater than 4 feet. Many of the commercial craft in the

project area have drafts greater than 4 feet and these vessels cannot use the short-cut from Dauphin Island Bay to Mobile Bay. Increasing the depth of the channel to 7 feet would remove this plug and facilitate vessel traffic.

2) Shoreline protection and protection of the Little Dauphin Island unit of the Bon Secour National Wildlife Refuge. The proposed beach nourishment action connected with the improvement of the Government Cut would continue to rehabilitate the eroding shorelines of both Little Dauphin Island and the segment of Dauphin Island below the former Pass Drury. Since Hurricane Frederic in 1979, these shorelines have experienced pronounced erosion. Shoreline protection would also be experienced should the eastern tip of Dauphin Island be used for disposal.

3) Protect the Government Cut portion of the Dauphin Island Bay navigation project from extensive shoaling and possible failure. Placement of the initial quantity of new work material and the future maintenance material from the Government Cut channel along the beach of Little Dauphin Island and the segment of Dauphin Island below the former Pass Drury would aid in the prevention of the failure of the Federal project. Erosion of Little Dauphin Island/Dauphin Island at Pass Drury as a result of Hurricane Frederic caused a breach to occur in that area. The movement of water through the breach contributed to erosion of the Little Dauphin Island barrier and shoaling of the Federal project.

4) Shorebird Habitat. Beach nourishment along both Little Dauphin and Dauphin Islands will insure continued shorebird habitat. The proposed disposal areas are frequently used by shorebirds for feeding and resting. Recent observations of shorebird activities in the project area by the State of Alabama, Department of Conservation and Natural Resources (ADCNR) suggest that the piping plover (*Charadrius melodus*), a Federally-listed endangered species, utilizes mudflats in the vicinity for feeding. Continued beach nourishment would aid in the prevention of erosion of Little Dauphin Island and the mudflats.

c. Other impacts.

1) Threatened and Endangered Species: Little Dauphin Island presently supports, according to information published by the State of Alabama, Non-Game Wildlife Program, a population of 50 piping plovers (*Charadrius melodus*). The piping plover was listed by the U.S. Department of the Interior (DOI), Fish and Wildlife Service (FWS), as a threatened species in Alabama in January 1986. The species is endangered in the Great Lakes watershed. These plovers utilize the mudflats on the west side of Little Dauphin Island as a primary feeding area while wintering in Alabama. The proposed improvement of the Government Cut would not adversely impact the plovers and the proposed beach nourishment action would take place on the east side of Little Dauphin Island and should not adversely impact the plovers.

According to Imhof (1976) and Mount (1986), piping plovers feed upon marine worms, fly larvae, beetles, crustaceans, mollusks and other small animals of sandy beaches. The dredging of the Government Cut and beach nourishment should not impact feeding activities or the potential food source of the piping plover. Also, the DOI, Region 4, Endangered Species Office, "*Red Book*" species account for the piping plover, dated June 1986, indicates that the primary reason for the current "threatened" status is due to the loss of appropriate sandy beaches and other littoral habitats as a result of commercial and recreational developments. The beach nourishment disposal which would occur as a result of the dredging action may make overwintering habitat more favorable for the species.

Plans for future disposal actions will consider the activities of these birds and be appropriately coordinated prior to implementation. Coordination with the DOI concerning this and other protected species indicates that no significant impact would occur.

According to Dr. Robert L. Shipp, Sea Turtle Stranding and Salvage Network (**STSSN**) Coordinator for the State of Alabama, sea turtles frequent the shores of Dauphin Island, but primarily the gulf shores of the island. While these turtles occasionally move up into the bay, these occurrences are not numerous. The turtle most commonly encountered along Alabama shores is the loggerhead sea turtle, *Caretta caretta*. The Kemp's ridley sea turtle, *Lepidochelys kempii*, is the most common sea turtle in the estuaries of Alabama and the second most common sea turtle along Alabama shores. The Kemp's ridley sea turtle is not known to nest in Alabama but, nesting occurs between April and June in its nesting range.

Coordination with the Protected Species Management Branch of the National Marine Fisheries Service (**NMFS**) was initiated for the most recent operation and maintenance dredging activity by letter dated March 9, 1987 and clearances were received by letter dated April 1, 1988. The material to be dredged in connection with the deepening of the Government Cut is proposed for placement in the same areas.

By letter dated April 17, 1989, the Mobile District initiated coordination of the proposed channel improvements at the Government Cut under the Fish and Wildlife Coordination Act (**FWCA**), Section 7 of the Endangered Species Act and the Coastal Barrier Resources Act (**CBRA**). By letter dated January 29, 1990, a final FWCA report was transmitted to the Mobile District. The report indicates that the proposed project is not expected to have an adverse effect on endangered or threatened species. By letter dated February 13, 1990 to the FWS, Daphne Field Office, the Mobile District determined that the proposed action at Government Cut would have no effect on endangered species under the purview of the FWS. By letter dated February 21, 1990, the FWS concurred with our "no effect" determination.

Also, coordination with the NMFS under Section 7 of the Endangered Species Act was initiated by letter dated April 18, 1989. By letter dated April 28, 1989, NMFS concurred with the Corps determination that populations of endangered or threatened species under their purview would not be adversely affected by the proposed improvement.

2) Prime farmland concerns. Prime farmland coordination for the most recent operation and maintenance activity was initiated, as required by the Farmland Policy Protection Act, with the U.S. Department of Agriculture (DOA), Soil Conservation Service (SCS), by letter dated February 11, 1988, and through the completion of Form AD-1006, the Farmland Conversion Impact Rating form. By letter dated February 17, 1988, the DOA acknowledged receipt of the completed Form AD-1006. Impacts to prime farmland are not anticipated.

3) Cultural properties concerns. There are no recorded archeological or historic sites or reported shipwrecks in the vicinity of the proposed work. No properties listed on or eligible for inclusion on the National Register of Historic Places are known to exist which would be affected by the proposed work. Coordination with the Alabama State Historic Preservation Officer (SHPO) concerning the most recent operation and maintenance activity was initiated by letter dated February 23, 1988, and clearance of the activity was indicated on February 25, 1988. Coordination of the proposed improvements to the project was initiated with the Alabama Historical Commission by letter dated July 3, 1989 and concurrence was received August 14, 1989.

4) Water Quality Certification and Coastal Zone Consistency. A 5-year State of Alabama water quality certification and a statement of coastal zone consistency were received from the State of Alabama, Department of Environmental Management (ADEM), by letter dated September 13, 1988, for the operation and maintenance dredging of the Government Cut and closure of Pass Drury. Certification expires on September 13, 1993.

Similarly, a 5-year water quality certification and statement of coastal zone consistency were received from the State of Alabama for the disposal of material dredged from the Government Cut channel around the eastern tip of Dauphin Island. The certification was requested by letter dated October 25, 1985, and was received on December 16, 1985. Certification expires on December 16, 1990.

Water quality certification and a statement of coastal zone consistency have been requested for the proposed Government Cut improvements. The new WQC would synchronize the above expiration dates.

5) Coastal Barrier Resources Act concerns. Coordination of the most recent operation and maintenance dredging activity with the DOI under CBRA was initiated by letter dated 25 April 1988. The DOI responded by

CBRA was initiated by letter dated 25 April 1988. The DOI responded by letter dated 31 May 1988, and indicated that the proposed action was consistent with the objectives of the Act. As stated earlier, CBRA consultation for the proposed improvements was initiated by letter dated April 17, 1989. The final FWCA report indicates that the proposed action is exempt under Section 6(a)(6) and Section 6(a)(6)(G) of the CBRA and is consistent with the purposes of the Act.

6) Section 404 (b)(1) Evaluation Report. The report is provided as an Appendix A to this assessment.

7. ALTERNATIVES TO THE PROPOSED ACTION.

a. **No action.** The no action alternative would call for no improvements to the Government Cut channel. Implementation of this alternative would require vessels with a draft of more than -4 feet MLLW continue to utilize the Pass aux Herons for access to Mobile Bay. Maintenance material dredged from the Government Cut portion of the Dauphin Island Bay navigation project would continue to be disposed on the beaches of Little Dauphin and Dauphin Islands.

b. **Improvement of the Government Cut channel to varying channel depths.** An array of project and advanced maintenance depths are being considered for the improvement of the Government Cut. These depths and their associated quantities of dredged material are presented in Table 1.

8. CONCLUSIONS MADE IN THE FINAL FISH AND WILDLIFE COORDINATION ACT REPORT.

The FWS indicated that the implementation of the Government Cut project would not have significant impacts on fish and wildlife resources in the project area. The FWS conferred with the Bon Secour National Wildlife Refuge and determined that the FWS has no conflict nor does it anticipate and problems relating to fish and wildlife resulting from the deepening of Government Cut. However, the FWS recommended several modifications to the project which, if implemented, would further reduce these minor impacts.

9. RECOMMENDATIONS MADE IN THE FINAL FISH AND WILDLIFE COORDINATION ACT REPORT AND RESPONSES TO THESE RECOMMENDATIONS.

The FWS recommended that two modifications be incorporated into the proposed project and its construction. These modifications are described below and are followed by the District's responses.

Recommendation 1: Dredge during the winter months (December - March) at which time aquatic resource spawning, migration, and colonial seabird nesting activities are lowest.

TABLE 1
GOVERNMENT CUT DEPTHS
AND
DREDGED MATERIAL QUANTITIES

DEPTH	5'	5'	6'	6'	7'	7'
ADVANCED MAINTENANCE	1'	2'	1'	2'	1'	2'
ALLOWABLE OVERDEPTH	1'	1'	1'	1'	1'	1'
CHANNEL WIDTH	40'	40'	40'	40'	40'	40'
NEW WORK QUANTITY	1,118	2,613	9,930	17,258	17,258	25,447
ANNUAL MAINTENANCE QUANTITY	1,120	1,120	1,120	1,120	1,120	1,120
50-YEAR MAINTENANCE QUANTITY	56,000	56,000	56,000	56,000	56,000	56,000

All depths given in the above table are in feet and the plane of reference is MLLW.

Channel width is given in feet and refers to channel bottom width.

All quantities are given in cubic yards and are reported as *in situ* yardage (no bulking factor has been applied).

Response to Recommendation 1: The Mobile District will, to the maximum extent practicable, dredge the Dauphin Island Bay navigation project during the recommended timeframe. However, it should be noted that dredging during a specific time of year is not always possible due to the manner in which the dredging job is contracted. The Corps of Engineers often has several dredging projects under one contract. The time of year that a project is dredged often depends upon the order of the project within the contract. Delays due to such things as poor weather conditions or equipment malfunction often require schedule changes in subsequent dredging jobs.

Recommendation 2: Monitor disposal activities so that output and settling rates protect against an incident of over disposal and possible movement of dredged material into sensitive areas.

Response to Recommendation 2: All dredging and disposal activities are monitored by a U.S. Army Corps of Engineers dredging inspector. All disposal activities would occur within the designated disposal areas in an environmentally sound manner.

Clarification of the portion of Recommendation 2 concerning "... protect against an incident of over disposal ...." was requested from the FWS, Daphne Field Office on February 13, 1990. The FWS indicated that the statement was for the purpose of assuring careful and watchful placement of dredged material and not for the purpose of instituting a dredge size restriction.

10. COMPLIANCE WITH APPROPRIATE ENVIRONMENTAL QUALITY STATUTES, ORDERS, AND POLICIES.

Federal Policies	Compliance
Archeological and Historic Preservation Act	FC
Clean Air Act	FC
Clean Water Act	FC
Endangered Species Act	FC
Estuary Protection Act	NA
Farmland Protection Policy Act	FC
Federal Water Project Recreation Act	NA
Fish and Wildlife Coordination Act	FC
Land and Water Fund Conservation Act	NA
Marine Protection, Research, and Sanctuaries Act	FC
National Historic Preservation Act	FC
National Environmental Policy Act	FC
Rivers and Harbors Act	NA
Watershed Protection and Flood Prevention Act	NA
Wild and Scenic Rivers Act	NA

The compliance categories used in the above table were assigned based upon the following definitions:

Full Compliance (FC) -- The favored plan has met all requirements of the statute.

Not Applicable (NA) -- The requirements of the statute are not applicable to the favored plan.

12. LIST OF AGENCIES, INTERESTED GROUPS AND PUBLIC CONSULTED.

Alabama Historical Commission, State Historic Preservation Officer, Montgomery, Alabama
State of Alabama, Department of Conservation and Natural Resources, Marine Resources Division, Dauphin Island, Alabama
State of Alabama, Department of Environmental Management, Mobile, Alabama
U.S. Department of Agriculture, Soil Conservation Service, Mobile, Alabama

U.S. Department of Commerce, National Marine Fisheries Service, Panama City, Florida
U.S. Department of Commerce, National Marine Fisheries Service, Protected Species Management Branch, St. Petersburg, Florida
U.S. Department of the Interior, Fish and Wildlife Service, Daphne, Alabama

13. LITERATURE CITED

Imhof, Thomas A. 1976. Alabama Birds. Second edition. University of Alabama Press. Page 167.

Mount, Robert H. 1986. Vertebrate Animals of Alabama in Need of Special Attention. Alabama Agricultural Experiment Station, Auburn University.

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U.S. Army Corps of Engineers. 1979. Environmental Assessment. Proposed Maintenance Dredging and Disposal, Ft. Gaines Channel Portion of Dauphin Island Bay, AL. July, 1979.

U.S. Army Corps of Engineers. 1985. Environmental Assessment for the Proposed Maintenance Dredging of a Portion of the Dauphin Island Bay, AL navigation project. November, 1985.

U.S. Army Corps of Engineers. 1987. Supplement to the Environmental Assessment for the Proposed Maintenance Dredging of a Portion of the Dauphin Island Bay, AL navigation project. April, 1987.

U.S. Army Corps of Engineers. 1988. Environmental Assessment for the Proposed Maintenance Dredging of a Portion of the Dauphin Island Bay navigation project and Closure of Pass Drury. August, 1988.

U.S. Department of the Interior. 1983. Endangered and Threatened Species of the Southeastern United States. Species Account for *Charadrius melodus* dated June 1986.

APPENDIX A

SECTION 404 (b)(1) EVALUATION REPORT FOR THE DISPOSAL OF NEW WORK MATERIAL FROM THE GOVERNMENT CUT PORTION OF THE DAUPHIN ISLAND BAY NAVIGATION PROJECT DAUPHIN ISLAND, ALABAMA

1. DESCRIPTION OF THE AUTHORIZED FEDERAL PROJECT.

Please refer to Section 1 of the environmental assessment to which this evaluation is appended.

a. **Location.** The Government Cut portion of the Dauphin Island Bay navigation project is located at the southeastern edge of Little Dauphin Island, Alabama, a coastal barrier in the lower portion of Mobile County, Alabama. Little Dauphin Island is bounded by Dauphin Island Bay on the west, Dauphin Island on the south, Mobile Bay on the east, and Mississippi Sound on the north. Please refer to Figure 1 contained in the referenced environmental assessment.

b. **Description of the Proposed Action.** The proposed action is described in Section 4 of the environmental assessment to which this evaluation is appended.

c. **Authority and Purpose.** The existing navigation project was authorized by the River and Harbor Acts of 2 March 1945 (H. Doc. 333, 76th Congress, 1st Session), and 3 September 1954 (H. Doc. 394, 82nd Congress, 2nd Session). The purpose of the proposed action is to improve the Government Cut channel by deepening, and thereby insure reliable navigation in the Government Cut portion of the Dauphin Island Bay Navigation Project and provide complementary depths between the Ft. Gaines channel and the State channel within Dauphin Island Bay. If the channel is not improved, many charter and pleasure vessels would be forced to continue using the Pass aux Herons as a means of entering Mobile Bay.

d. **General Description of the Discharge Site.** The discharge site is described in detail in Section 4 of the environmental assessment to which this evaluation is appended.

Generally, the site to be utilized is the beach on the eastern side of Little Dauphin and Dauphin Islands adjacent to the Government Cut. This beach disposal area would extend from the jetties adjacent to Ft. Gaines channel to

a point on Little Dauphin Island 2,000 feet north of what was formerly Pass Drury, and the littoral zone along that beach to about 150 feet offshore (Figure 2). Also, an alternate disposal area is the eastern tip of Dauphin Island in the vicinity of Ft. Gaines (Figure 2) which is experiencing significant erosion. This alternate area is about 3,000 feet long and begins at the northeastern tip of Dauphin Island at Pelican Point and proceeds around the tip of the island to the south and then westerly along the southern shore of the island to approximately the property line of the U.S. Coast Guard facility. The material would be disposed from the shoreline seaward to about 250 feet and to a shoreline elevation of about +5 feet MLLW.

2. FACTUAL DETERMINATIONS.

a. **Physical Substrate Determinations.**

(1) **Substrate elevation and slope.** The beach area to be disposed upon ranges in elevation from approximately -4 feet MLLW to approximately +3 feet MLLW. The disposal area at the eastern tip of Dauphin Island ranges in elevation from -6 feet MLLW to approximately +5 feet MLLW.

(2) **Sediment type.** The dominant sediment type of the material proposed for disposal is sand with some small quantities of silt. An analysis of the sediment was last conducted in 1974 during a District-wide sediment sampling program (Gulf South Research Institute 1977); however, recent field examination of the material during the maintenance dredging action conducted in June 1989 indicates that the material is a medium grade sand.

(3) **Dredged/fill material movement.** Currents in the vicinity of the proposed disposal area are tidal and wind driven and tend to erode the shoreline in the vicinity of the project. In 1985, Hurricane Elena caused extensive erosion of Little Dauphin Island. Depending upon wind and wave direction, the sediment would move either to the northwest or southeast along the Little Dauphin Island beach. Movement of material in the disposal site adjacent to Ft. Gaines is predominantly in a southerly direction out of the bay and then in a westerly direction along the beach. However, if material is placed too far north at the tip, the material has a tendency to move north and then west into Ft. Gaines channel.

(4) **Physical effects on benthos.** Some benthic organisms would be destroyed by the proposed action, however, due to the dynamic state of the shoreline, the impacts should not be significant.

(5) **Other effects.** Not applicable.

(6) **Actions taken to minimize impacts.** No other actions to minimize impacts to the physical substrate are deemed appropriate for this project.

b. **Water Circulation/Fluctuation, and Salinity Determination.**

(1) **Water** (No significant effects on (a) through (i) below)

(a) Salinity.
(b) Water chemistry.
(c) Clarity.
(d) Color.
(e) Odor.
(f) Taste.
(g) Dissolved gases.
(h) Nutrients.
(i) Eutrophication.

(2) **Current Patterns and Circulation**

(a) Current patterns and flow. No significant effects.

(b) Velocity. No significant effects.

(c) Stratification. No significant effects.

(d) Hydrologic effects. No significant effects.

(3) **Normal Water Level Fluctuations.** No significant effects.

(4) **Salinity Gradients.** No significant effects.

(5) **Actions That Will Be Taken To Minimize Impacts.** No other actions that would minimize impacts on water circulation/fluctuation and salinity are deemed necessary.

c. **Suspended Particulate/Turbidity Determinations.**

(1) **Expected changes in suspended particulate and turbidity levels in the vicinity of the disposal site.** Beach nourishment with new work material removed from the Government Cut channel would result in increased turbidity and suspended particulates along the eastern edge of Little Dauphin and Dauphin Islands for a short period of time following the action. No significant effects are expected as a result of this action.

Continued use of the beach nourishment area on Little Dauphin and Dauphin Island would not result in significant changes in subject levels. Also, use of the eastern tip of Dauphin Island near Ft. Gaines would have no significant effects on these levels.

(2) **Effects on the chemical and physical properties of the water column.** No significant effects on (a) through (f) below.

(a) Light penetration.
(b) Dissolved oxygen.
(c) Toxic metals and organics.
(d) Pathogens.
(e) Aesthetics.
(f) Others as appropriate.

(3) **Effects on biota.**

(a) Primary production, photosynthesis. The beach nourishment and littoral disposal of dredged material would not significantly affect either of these parameters.

(b) Suspension/filter feeders. No significant effects.

(c) Sight feeders. No significant effects.

(4) Actions taken to minimize impacts. No further actions are deemed appropriate.

d. **Contaminant Determination.** No significant effects. New work materials to be removed from the Government Cut are reasonably removed from sources of pollution such that no significant impacts would occur. Unless conditions significantly change in this area of Dauphin Island, future maintenance material would also be removed from sources of contamination.

e. **Aquatic Ecosystem and Organism Determinations.**

(1) **Effects on plankton.** No significant effects.

(2) **Effects on benthos.** Benthic organisms would be destroyed by beach nourishment and littoral disposal. The disposal areas, however, are highly dynamic areas and subject to rapid erosion. Therefore, the impacts would not be significant.

(3) **Effects on nekton.** No significant effects.

(4) **Effects on aquatic food web.** No significant effects.

(5) **Effects on special aquatic sites.**

(a) Sanctuaries and refuges. The DOI indicated in the Final FWCA Report that the proposed action is consistent with the objectives of CBRA. The FWS, Daphne Field Office, conferred with the Bon Secour

National Wildlife Refuge and determined that the FWS has no conflict nor does it anticipate any problems relating to fish and wildlife resulting from the deepening of Government Cut.

(b) Wetlands. Not applicable.

(c) Mud Flats. Not applicable.

(d) Vegetated shallows. Not applicable.

(e) Coral reefs. Not applicable.

(f) Riffle and pool complexes. Not applicable.

(6) **Threatened and endangered species.** No threatened or endangered species would be impacted by the proposed action. The proposed action was coordinated with both the NMFS and the FWS and both agencies have concurred that beach nourishment and littoral disposal would not affect any such species.

(7) **Other wildlife.** No significant effects.

(8) **Actions to minimize impacts.** No other actions to minimize impacts on the aquatic ecosystem are deemed appropriate.

f. **Proposed Disposal Site Determinations.**

(1) **Mixing zone determinations.** ADEM delineates mixing zones on a case by case basis. In all cases mixing zones would be restricted to as small an area as possible. It is felt that any reasonable mixing zone requirement established by ADEM would be met. No problems in meeting mixing zone requirements have ever been experienced when conducting operation and maintenance activities on this project and no problems are anticipated for the navigation improvement.

(2) **Determination of compliance with applicable water quality standards.** The proposed action would be in compliance to the maximum extent practicable with all applicable water quality standards. Both disposal areas have been certified for use by ADEM. Water quality certification for the use of the site at the eastern tip of Dauphin Island was given by letter dated December 16, 1985 and expires December 16, 1990. Similarly, water quality certification for the beach nourishment disposal area on the eastern side of Little Dauphin and Dauphin Islands was given by letter dated September 13, 1988. Certification expires on September 13, 1993.

(3) Potential effects on human use characteristics.

(a) Municipal and private water supply. No significant effects.

(b) Recreational and commercial fisheries. No significant effects.

(c) Water-related recreation. No significant effects.

(d) Esthetics. Only temporary degradation to the esthetic environment would occur as a result of the proposed action. Impacts would primarily be as a result of the physical presence of the dredge pipe and associated support equipment.

(e) Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves. No significant effects.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. The beach nourishment on Little Dauphin and Dauphin Islands adjacent to the Government Cut and around the tip of Dauphin Island near Ft. Gaines would have no significant cumulative adverse impacts. Repeated nourishment of the area would have continuing effects on benthic organisms in the area, however, this destruction would be offset by the nourishment of the beach which, if not nourished, would continue to erode and jeopardize the future existence of the Federal channel. Also, Little Dauphin Island is a portion of the Bon Secour National Wildlife Refuge and a coastal barrier. Loss of the island by erosion would remove this island, or a portion of this island, from the coastal barrier island system.

h. Determination of Secondary Effects on the Aquatic Ecosystem. No significant secondary effects on the aquatic ecosystem would occur.

3. FINDING OF COMPLIANCE.

a. No significant adaptations to the guidelines were made relative to this evaluation.

b. Several alternatives to the proposed method of accomplishing the action at Government Cut are available. These alternatives were discussed in the environmental assessment to which this evaluation is attached and are given as follows:

(1) No action

(2) Beach nourishment

(3) Shoreline protection

Subsequent to the evaluation of these alternatives, it is suggested that the proposed action is the least environmentally damaging alternative. The proposed action would destroy benthos in the area but would assist in preventing the rapid erosion of Little Dauphin and Dauphin Islands.

c. A Clean Water Act (CWA) Section 401 Water Quality Certification and a Coastal Zone Consistency statement have been requested from ADEM.

d. The proposed activity would not harm endangered or threatened species. No critical habitats of any endangered species exist within the project area.

e. The proposed activity would not result in any significant adverse effects on human health or welfare, including municipal or private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife would not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values would not occur.

f. No wetlands would be destroyed by the proposed action.

g. The proposed plan is specified as complying with the requirements of these guidelines.

DATE 7 Mar 90

LARRY S. BONINE
Colonel, Corps of Engineers
District Engineer

APPENDIX A

APPENDIX A
ECONOMIC ANALYSIS

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ECONOMIC ANALYSIS

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DETAILED PROJECT REPORT

GOVERNMENT CUT AT

DAUPHIN ISLAND, ALABAMA

INTRODUCTION

This report is an evaluation of the economic losses to the vessels that would use a proposed deepening of the existing Federal channel, and, the benefits allocated to the 4 proposed alternatives to reduce those losses. Within this report there are seven (7) additional sections as follows:

a. Socio-Economic Profile

b. General

c. Vessel Characteristics

d. Methodology

e. Without Project Condition

f. With Project Condition

g. Conclusion

SOCIO-ECONOMIC PROFILE

Dauphin Island is located in Mobile County, Alabama approximately 22 miles South of the City of Mobile on the Gulf of Mexico. It is 15 miles in length and 1 mile in width at its broadest place. Dauphin Island was incorporated in 1987.

In 1980, the U. S. Census of Population showed 633 persons living on Dauphin Island (Census Tract 72.01). Mobile County contained 364,980 people and the State numbered 3,893,888 residents for the same period of time. Dauphin Island residents had a significantly higher per capita income than the average person living in the County and State. In 1980, the average per capita income (1980 dollars) in Alabama was $5,894 while Mobile County and Dauphin Island had per capita incomes of $6,047 and $11,360, respectively. The total number of working people that resided on Dauphin Island, in Mobile County, and, in Alabama that were employed in 1980 were: 212; 142,825; and 1,511,928 respectively. Table 1 displays selected characteristics for the State and County for designated past and projected years.

TABLE 1
SELECTED DEMOGRAPHICS

CATEGORY	1978	1983	1990	2000	2015	2035
POPULATION						
ALABAMA	3,834,200	3,950,900	4,032,429	4,162,838	4,438,126	4,693,435
MOBILE COUNTY	360,100	375,400	378,441	391,709	419,994	444,678
DAUPHIN ISLAND *						
PER CAPITA INCOME (1972$)						
ALABAMA	4,175	4,321	5,192	6,169	7,273	8,814
MOBILE COUNTY	4,315	4,284	5,019	5,863	6,821	8,177
DAUPHIN ISLAND *						
TOTAL EARNINGS (1,000 '72$)						
ALABAMA	12,343,922	11,974,658	15,077,869	18,621,519	23,034,619	27,970,578
MOBILE COUNTY	1,227,124	1,170,975	1,438,588	1,760,905	2,163,356	2,609,802
DAUPHIN ISLAND MEAN HOUSEHOLD *						
TOTAL EMPLOYMENT						
ALABAMA	1,653,582	1,640,273	1,793,495	1,963,712	2,059,707	2,034,382
MOBILE COUNTY	152,895	147,756	160,818	177,213	187,865	184,951
DAUPHIN ISLAND *						

* SOURCE: 1986 COUNTY LEVEL PROJECTIONS OF ECONOMIC ACTIVITY AND POPULATION 1990-2035
SOURCE: TRACT 72.01, 1980 GENERAL POPULATION CHARACTERISTICS FOR ALABAMA CENSUS TRACTS

GENERAL

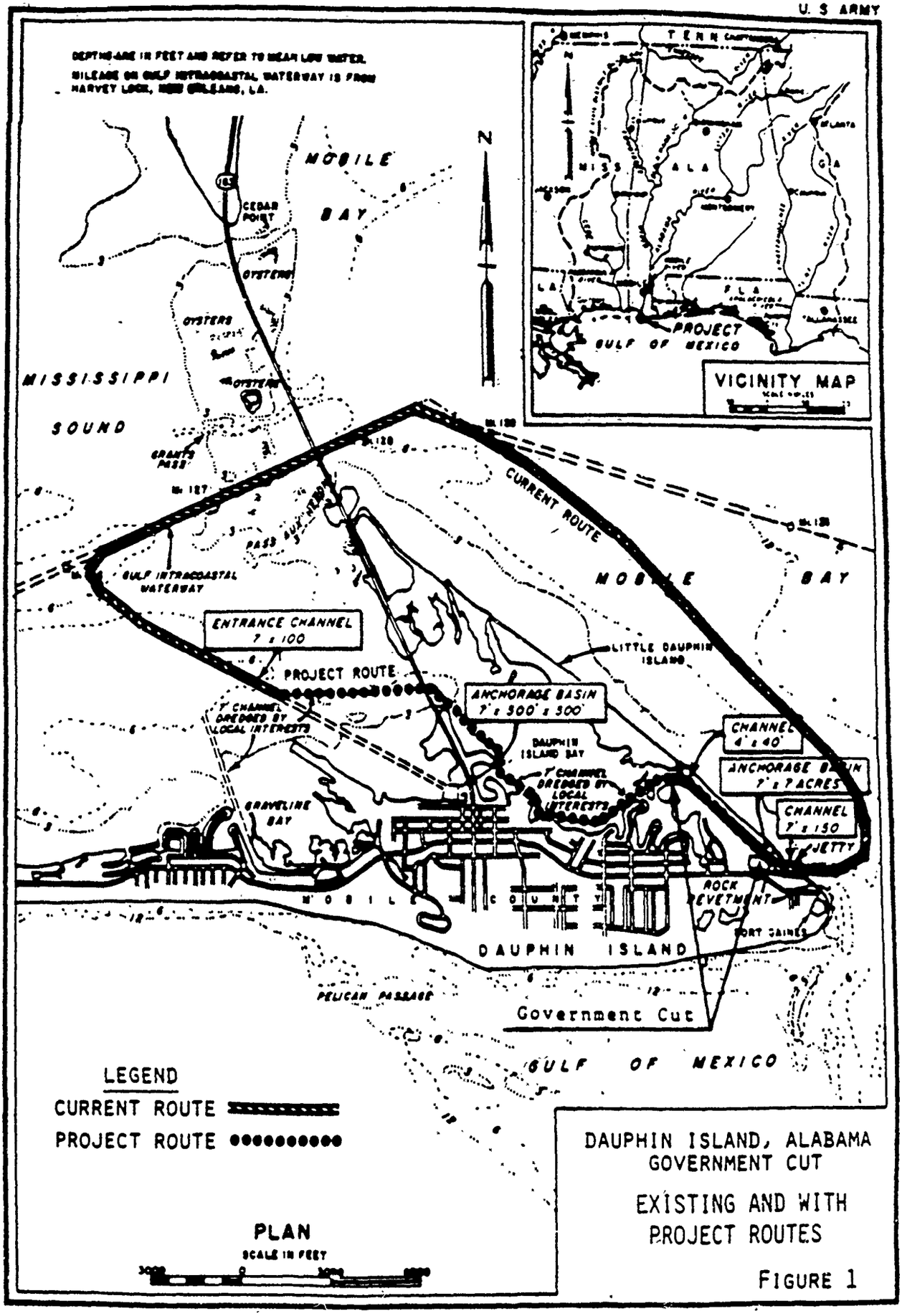
Government Cut is a federally maintained channel located on the eastern end of Dauphin Island between an anchorage basin, known as Billy Goat Hole, and Dauphin Island Bay. Since Hurricane Frederick in 1979, siltation, from a blowout located on the northern end of the project on Little Dauphin Island, has kept the depth of the channel at approximately 2.0 feet mean low water. Figure 1 shows the location of the study area in relation to Dauphin Island.

Government Cut Channel provides a shorter and quicker route to the Gulf for vessels berthed on the western side of Dauphin Island Bay and in the bay itself, and, provides a quick route to the Mississippi Sound for boats berthed on the southern side in the Billy Goat Hole anchorage basin. The dotted line in Figure 1 shows the route to be used with a project in place. This route has a natural channel inside Dauphin Island Bay that is approximately 6.0 to 7.0 feet deep at mean low water. An additional use of the project is for vessels to fuel/ice at a marina within Dauphin Island Bay and a shorter route for the sale of fishing catches for commercial fishermen at Aloe Bay (West of Dauphin Island Bay). The blowout on Little Dauphin Island (Pass Drury) will be repaired in May, 1989 and the Government Cut depth at mean low water will be maintained at the existing authorized depth of 4.0 feet.

Between 1979 and May, 1989, no vessels with drafts greater than 2.0 feet have used the project because of it's lack of depth. This shallow depth resulted from rapid and heavy shoaling through Pass Drury and into Government Cut. The present route for vessels with drafts greater than 2.0 feet is around the outside (East side) of Little Dauphin Island through Mobile Bay and into the Gulf. During a field interview in July, 1988; it was found that some of the larger vessels could not use the project, even with adequate depth, because of a bridge constraint (Highway 163) located between Dauphin Island Bay and the Mississippi Sound. This constraint is from lack of bridge height, which stops double rigged shrimp boats and other vessels with high riggings that draft greater than 6.0 feet, from using the south route under a bridge to go in into an anchorage basin in Aloe Bay. Delays from rerouting around Little Dauphin Island average approximately one hour round trip. The round trip distance around Little Dauphin Island is approximately 18 miles versus approximately 5 miles using the Government Cut.

Vessel Characteristics

A total of 112,444 vessels are located in the immediate vicinity of the project area or use the facilities at least once annually. Included in this total is an estimated 112,000 day boaters who use the public launch located at Billy Goat Hole. This estimate of day boaters is from the Alabama Department of Conservation's Division of Marine Resources (112,000 visitations). For purposes of this study, it is assumed that these day boaters use the Gulf 100 percent of the time and do not use the project.


U. S ARMY
DEPTHS ARE IN FEET AND REFER TO MEAN LOW WATER.
MILEAGE ON GULF INTRACOASTAL WATERWAY IS FROM HARVEY LOCK, NEW ORLEANS, LA.
MOBILE BAY
CEDAR POINT
OYSTERS
MISSISSIPPI SOUND
GRANTS PASS
PASS AUX HERON
GULF INTRACOASTAL WATERWAY
CURRENT ROUTE
ENTRANCE CHANNEL 7' x 100'
PROJECT ROUTE
7' CHANNEL DREDGED BY LOCAL INTERESTS
ANCHORAGE BASIN 7' x 500' x 500'
LITTLE DAUPHIN ISLAND
DAUPHIN ISLAND BAY
CHANNEL 4' x 40'
ANCHORAGE BASIN 7' x 7 ACRES
CHANNEL 7' x 150'
JETTY
GRAVELINE BAY
ROCK REVETMENT
FORT GAINES
MOBILE COUNTY
DAUPHIN ISLAND
PELICAN PASSAGE
Government Cut
GULF OF MEXICO
N
TENN
MISS
ALA
GA
LA
FLA
PROJECT
GULF OF MEXICO
VICINITY MAP
LEGEND
CURRENT ROUTE
PROJECT ROUTE
PLAN
SCALE IN FEET
DAUPHIN ISLAND, ALABAMA
GOVERNMENT CUT
EXISTING AND WITH PROJECT ROUTES
FIGURE 1

Of the remaining 444 vessels, 39 will not use the project. Fourteen of these vessels are located in the south east basin area and 25 are located in the berthing area west of Dauphin Island Bay. All of these 39 vessels are commercial and 36 are larger drafting shrimp boats. Thirty-six shrimp boats will not use the project due to the bridge constraint. The remaining 3 vessels, in Billy Goat Hole, are crew boats. These three vessels considered time a higher priority, than fuel savings, to get to their various destinations. During a field survey, the operators of these crew boats were of the opinion that the slower speed though the project would not be to their advantage.

As shown on Table 2, it is estimated that approximately 405 of the 444 vessels would use the channel at least once a year, if there was adequate depth. Of these 405 vessels, 357 vessels are recreational boats and 48 are commercial vessels. Eighty-eight percent of the vessels using the project are recreational vessels, the remaining 12 percent are commercial.

The vessel count contained in Table 2 was from a field survey conducted in July 1988. Vessel characteristics were derived from field interviews with vessel owners/operators and other interested parties. Telephone surveys were used to supplement the information. Based on the above interviews, it is estimated that approximately 50 transient shrimp boats (on an average) use the two outside berthing areas weekly, year round in addition to the local fleet. Twenty-two of these transient vessels use the project. These vessels vary in size from week to week. For this analysis, vessel characteristics for the transient shrimpers were estimated by Mobile District personnel based on the local shrimp fleet at Dauphin Island.

There are three general locations for vessels to berth: an anchorage basin southeast of the project named Billy Goat Hole, two areas inside Dauphin Island Bay, and an anchorage basin in Aloe Bay (west of Dauphin Island Bay). Vessel counts were made by general berthing location and included data on: vessel draft, number of annual trips, and recreational or commercial in usage.

One hundred twelve thousand recreational boats and thirty-three commercial vessels originate at the Billy Goat Hole berthing area. It is assumed that none of the 112,000 recreational vessels in Billy Goat Hole make use of the project. Of the 33 commercial vessels, 28 are shrimp boats (21 transient and 7 local), and, 5 are other non-recreational vessels. With adequate depth, it is estimated that 19 of the 33 commercial vessels will use the project. Sixteen of the above 19 vessels are shrimp boats and 3 are U.S. Coast Guard vessels. It is estimated that 9 of the 21 transient vessels at Billy Goat Hole would have drafts that could use Government Cut.

TABLE 2

AREA AND PROJECT VESSEL CHARACTERISTICS

LOCATION AND CATEGORY OF VESSEL	DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
FEDERAL CUT USE									
RECREATIONAL									
SOUTH AND EAST OF DAUPHIN ISLAND BAY 1/	0	0	0	0	0	0	0	0	0
INSIDE DAUPHIN ISLAND BAY 2/	0	0	35	20	36	266	0	0	357
WEST OF DAUPHIN ISLAND BAY									
SUBTOTAL	0	0	35	20	36	266	0	0	357
COMMERCIAL									
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	7	10	2	0	0	19
INSIDE DAUPHIN ISLAND BAY	0	0	2	6	1	5	0	0	14
WEST OF DAUPHIN ISLAND BAY	0	0	1	7	5	2	0	0	15
SUBTOTAL	0	0	3	20	16	9	0	0	48
TOTAL	0	0	38	40	52	275	0	0	405

1/ RECREATIONAL FISHING OCCASIONS CONSIDERED AS 100% AT THE PUBLIC LAUNCH AND WERE GOING TO THE GULF.

2/ LOCAL ESTIMATE OF 50 VESSELS BERTHED AT CONDO AREA. USED PERCENT DISTRIBUTION OF MARINA VESSELS.

There are two sub-berthing areas that make up the Dauphin Island Bay berthing area: a condominium complex and a marina. A total of 371 vessels are berthed at this location as shown in Table 2. Based on local information, it is estimated that 50 recreational vessels are docked at or near the condominiums and 321 vessels are either berthed or stored at the marina. All of the boats are power boats and 307 of the 321 vessels are recreational. The non-recreational vessels (14) were charter boats (4), State and Federal vessels (4), and oil exploration craft (6). All of the 371 vessels will use the project if there is adequate depth.

The third area is a berthing area to the west of Dauphin Island Bay in Aloe Bay. A total of 40 vessels originate from this site. All of the vessels are non-recreational craft. Thirty-seven vessels are shrimp boats and 3 are other non-recreational power boats. Of the 40 total vessels, 13 shrimp boats and 2 Federal vessels will use the project. All of the shrimpers are from the transient fleet.

Methodology

The methodology for evaluating economic benefits is consistent with the Water Resource Council's principles and guidelines (P&G) and Corps of Engineers regulation ER 1105-2-40. The benefits from implementation of channel modifications at the Government Cut channel are attributable to the comparative economic advantage of the "with-project" condition over the "without-project" condition. The benefit evaluation primarily focuses on the means of reducing or eliminating routing costs due to inadequate depths. This was done by estimating the variable operating costs under the without project condition route and comparing them to the variable operating costs under the various with project conditions. Recreational and commercial trips are broken out by draft and then summed to a composite total number of annual trips. Costs, contained on Table 3, are based upon hourly variable operating costs of the vessels by draft, and these costs are multiplied by the applicable travel times. The per trip cost was multiplied by the number of trips to determine the annual variable operating cost for each route. These costs were then summed to display the total annual variable operating trip costs to the 405 vessels.

Without-Project Condition

The Without Project condition is shown first under Existing Conditions and then over a 50 year period when a project could be in place (Without Project Future Conditions). Under Existing Conditions (1989) 405 vessels are experiencing additional travel costs due to rerouting around Little Dauphin Island, when they wish to route through Government Cut. It is estimated that 2,895 trips out of 13,208 total trips were rerouted around Little Dauphin Island in 1989. These 2,895 trips had a total variable operating cost of $37,200.

Over a 50 year period (1990-2039), it is estimated that the fleet will expand. It is expected that the fleet will show simple growth of 6% for recreational and .6% for commercial vessels over a 20 year period and then stabilize. Vessels, through vessel trips, were estimated at three points in time: Year 1, Year 10 and Year 20. These points in time represent compounded annual growth of 4.7% in recreational vessels and .5% in commercial vessels. Years 1, 10, and 20 estimate total trips to number 2,915, 3089, and 3,317. The total variable operating costs of these vessel trips which are routed around Little Dauphin Island total $37,800, $42,800, and $48,700. The calculations and rationale for the above trips and costs are discussed below.

From Table 2, an inventory of 405 vessels was shown to navigate the Highway 163 bridge and would use the project route under if there was adequate depth in the project. Using tidal gauge information from Table 4, the annual vessel trips of each vessel (by draft) was multiplied by the probability (percent of time) that the tide (channel depth) was equal to the draft of the vessel with no (0 foot) underkeel clearance. This provided an estimate of the trips not detoured under existing conditions. Trips detoured were calculated using one (1) minus the percent availability of the above draft (percent unavailability of all tides at a given depth). Information on the Dauphin Island tides was from the Marine Lab tide gauge located in Dauphin Island Bay. This tidal data was given by the Mobile District Office (MDO) Hydraulics Branch to the MDO Economics Section. Monthly tides are shown by day for the year 1987 at the end of the report.

The Marine Lab gauge in Dauphin Island Bay was used to determine the depth of the project channel with historical high tides and their probability of occurring in a given year. The period of record for this gauge was from 1963 to 1987. Depths between the given stages of percent exceedance were interpolated. Table 4 shows (a) the tide stages at a given gauge elevation (b) those stages converted to National Geodetic Vertical Datum (NGVD); (c) the interpreted stages at NGVD; (d) corresponding vessel drafts in whole feet at MLW; and (e) the percent of the time of tide availability of the interpreted NGVD stages that correspond to MLW drafts is also shown.

Two examples of the method used to estimate vessel trips are presented below. An example computation of the method used to interpolate the percent exceedance (the percent of tide availability of vessel trips using the project on Table 4) is shown below for vessels drafting 8.0 feet of water. The channel has a maintained 0.0' MLW water surface (a -4.0' MLW channel depth). In order for a 8.0' foot draft vessel to navigate the channel under the without-project condition, this vessel would need a water surface, with tide, at or above 4.0' MLW (a 8.0+ foot channel depth at MLW).

To correlate the draft of the 8.0' vessel to the channel with the percent exceedance, this 8.0 foot MLW channel depth (which is equal to a depth of +3.66' NGVD) is shown below. The percent exceedance for 3.66' NGVD is computed by interpolation between the tide gauge depths 3.8' and 4.3', and converted to NVGD (3.47 NGVD and 3.97 NGVD) and their corresponding percent exceedances of 09% and 01% (percent of high tide availability): ((3.66'-3.97')/(3.47'-3.97')*(.09%-.01%))+.01% = .06%.

TABLE 3
VARIABLE OPERATING COSTS

DRAFT	CATEGORY	AVG. DOLLARS
SHRIMP	AVG CREW	1
2.0'	TOTAL REVENUES	7142
P 2-48	FIXED COSTS	1205
	VAR COSTS	3158
	CREW SHARE	1914
	REV - F/V COST	2779
	CAPT WAGES	2778
	ADJ. V COSTS	5936
	DAYS FISHING	74
	CAPT HR WAGE	3.13
	HR VAR OPER COST	6.68
	FIX/ VAR COST	7141

DRAFT	CATEGORY	AVG. DOLLARS
SHRIMP	AVG CREW	1.3
3.0'	TOTAL REVENUES	25910
P 2-50	FIXED COSTS	5537
	VAR COSTS	12249
	CREW SHARE	7743
	REV F/V COST	8124
	CAPT WAGES	8124
	ADJ. V COSTS	20373
	DAYS FISHING	154
	CAPT HR WAGE	4.40
	HR VAR OPER COST	5.51
	FIX/ VAR COST	25910

DRAFT	CATEGORY	AVG. DOLLARS
SHRIMP	AVG CREW	1.1
4.0'	TOTAL REVENUES	31398
P 2-52	FIXED COSTS	6904
	VAR COSTS	19426
	CREW SHARE	5764
	REV - F/V COST	5068
	CAPT WAGES	5068
	ADJ. V COSTS	24494
	DAYS FISHING	159
	CAPT HR WAGE	2.66
	HR VAR OPER COST	6.42
	FIX/ VAR COST	31398

DRAFT	CATEGORY	AVG. DOLLARS
SHRIMP	AVG CREW	1.3
5.0 +	TOTAL REVENUES	40401
P 2-48	FIXED COSTS	7971
	VAR COSTS	24591
	CREW SHARE	10919
	REV - F/V COST	7039
	CAPT WAGES	7039
	ADJ. V COSTS	32430
	DAYS FISHING	129
	CAPT HR WAGE	5.06
	HR VAR OPER COST	10.47
	FIX/ VAR COST	40401

TABLE 4
PERCENT EXCEEDANCE: WITHOUT PROJECT CONDITION

A	B		C	D	E	
TIDE GUAGE DEPTH	NGVD DEPTH	PERCENT EXCEED	INTERPRETED		PERCENT EXCEED	4.0' W/O PROJ with 3' BOTTOM
			NGVD DEPTH	MLW DEPTH		
	-5.00	100.00%	-4.34	-4.0'	100.00%	0.0'
-3.7	-4.03	100.00%	-3.34	-3.0'	100.00%	1.0'
-3.2	-3.53	100.00%				
-2.7	-3.03	100.00%	-2.34	-2.0'	100.00%	2.0'
-1.7	-2.03	100.00%				
-1.2	-1.53	99.99%	-1.34	-1.0'	99.98%	3.0'
-0.7	-1.03	99.98%				
-0.2	-0.53	98.52%	-0.34	0.0'	97.24%	4.0'
0.3	-0.03	95.15%				
0.8	0.47	80.64%	0.66	1.0'	68.99%	5.0'
1.3	0.97	50.08%				
1.8	1.47	18.20%	1.66	2.0'	12.45%	6.0'
2.3	1.97	3.06%				
2.8	2.47	0.68%	2.66	3.0'	0.51%	7.0'
3.3	2.97	0.23%				
3.8	3.47	0.09%	3.66	4.0'	0.06%	
4.3	3.97	0.01%				

A second example estimates the number of trips using Government Cut and being rerouted around Little Dauphin Island for the above 8.0 ' vessel. If the 8.0' vessel made 100 trips per year, less than 1 trip (100 * .0006 or .06%= .06 trips) would be made annually under the without-project condition through the Government Cut and (1 - .0006 = .9994 * 100 = 99.94) or 100 trips would be routed around Little Dauphin Island. By draft, Table 4 displays the percentage of time that navigable high tides are available for vessels drafting 8 feet or less, under the without project condition.

The route of the vessel trips and time of day were assumed to coincide with high tide availability and benefits to the study were based on savings from rerouting through the project. Tidal delays were not further considered in this study. There are no known damages to the vessels using the present project channel. Local information, during the field survey, revealed that the bottom was soft and could be used with zero underkeel clearance, under normal wind and wave conditions.

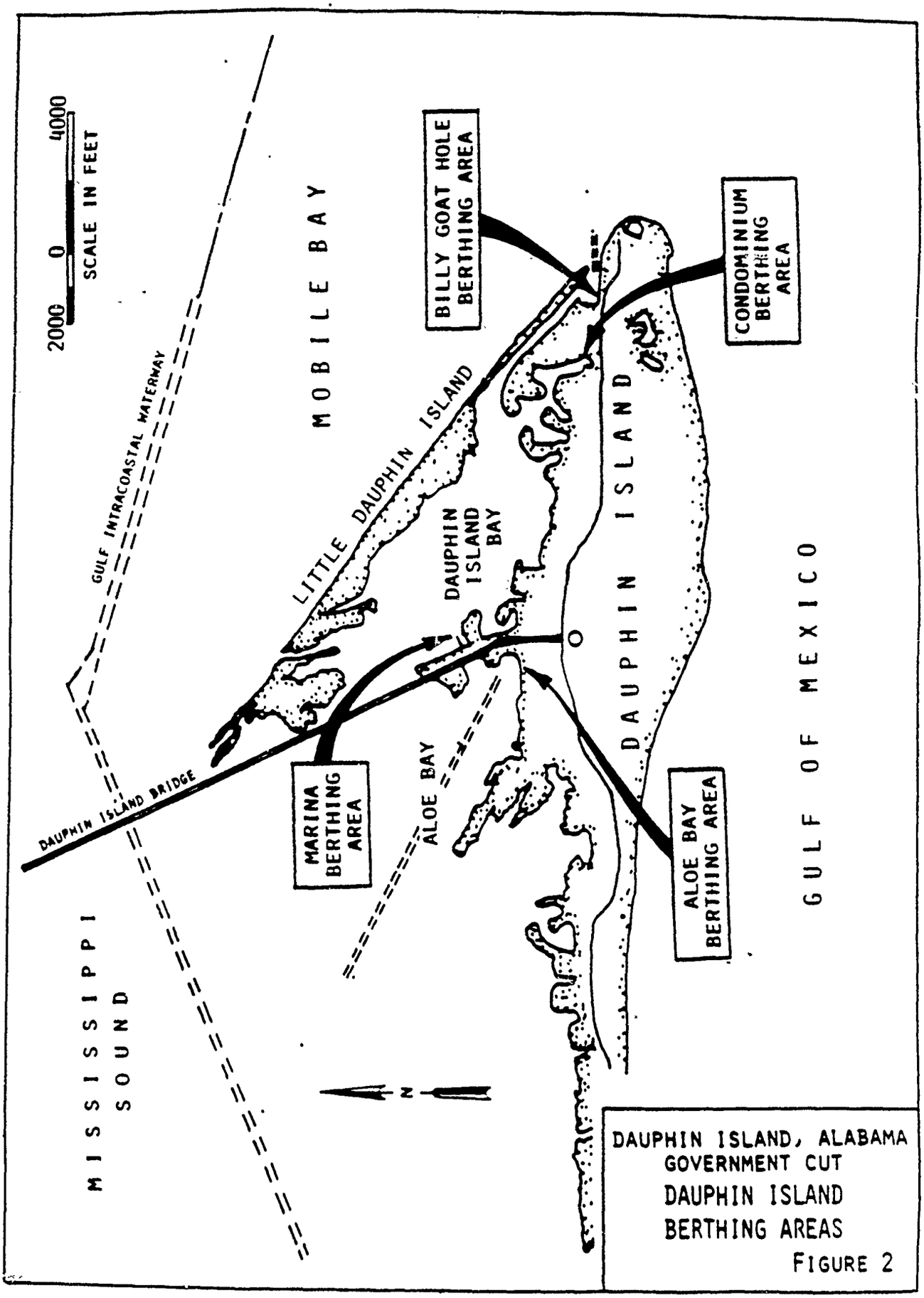
Table 5 shows the total number of trips (13,208) that the 405 vessels make over a year, the number of trips that the vessels make with a 4.0 foot channel (10,313), and the number of trips that the vessels are re-routed (2,895) under the existing condition. During the July, 1988 field trip, the surveyed boat operators estimated the number of annual vessel trips made by their vessels. General area destinations were included within these estimates. The estimates of the trips of the remaining local vessels that were extrapolated from the responses of the surveyed operators with similar vessels.

Recreational vessels, inside Dauphin Island Bay (357), are expected to make a total of 14 trips per boat each year (4,908). Of these 14 trips, it is estimated that 10 trips (3,570) will be with the project route to the Gulf, assuming adequate depth is available. Figure 2 shows the location of the Southeast Basin (Billy Goat Hole) and the two other berthing areas.

Under existing conditions, commercial vessels make 9,638 vessel trips annually. The commercial trips originating from the south east berthing area: Billy Goat Hole, totaled 1,642. These trips were from transient shrimpers (468), local shirmpers (364), and other commercial boating activities (810). The annual trips within Dauphin Inland Bay (4,400) were from commercial vessels other than shrimpers. All of these vessels were berthed at the marina, shown in Figure 2. Trips from the berthing area west of Dauphin Island Bay numbered 3,596 yearly. The vessels using this berthing area were transient shrimpers (676) and non-shrimping commercial vessels (2,920) berthed at Aloe Bay.

TABLE 5
GOVERNMENT CUT CHANNEL WITH 4.0 FOOT AT MLW
EXISTING CONDITION

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 4.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	350	200	360	2660	0	0	3570	$0	$0	$9,527	$3,660	$4,625	$33,250	$0	$0	$51,100
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	350	200	360	2660	0	0	3570	$0	$0	$9,903	$1,736	$250	$0	$0	$0	$51,100
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$6,999	$1,709	$206	$0	$0	$9,000
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$1,675	$4,400	$560	$9,405	$0	$0	$16,000
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$14,375	$12,191	$855	$206	$0	$0	$27,700
SUBTOTAL	0	0	1630	3430	950	3628	0	0	9638	$0	$0	$16,050	$23,589	$3,124	$9,977	$0	$0	$52,700
TOTAL	0	0	1980	3630	1310	6288	0	0	13208	$0	$0	$24,953	$25,325	$3,374	$9,977	$0	$0	$103,900
VESSEL FEDERAL CUT USE WITH TIDE: 4.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	43	138	350	2660	0	0	3191	$0	$0	$624	$1,932	$4,375	$33,250	$0	$0	$40,200
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0									
SUBTOTAL	0	0	43	138	350	2660	0	0	3191	$0	$0	$624	$1,932	$4,375	$33,250	$0	$0	$40,200
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	703	506	104	0	0	1313	$0	$0	$0	$3,691	$1,619	$206	$0	$0	$5,600
INSIDE DAUPHIN ISLAND BAY	0	0	21	442	165	3428	0	0	4048	$0	$0	$110	$2,321	$520	$9,405	$0	$0	$12,400
WEST OF DAUPHIN ISLAND BAY	0	0	182	1222	253	104	0	0	1761	$0	$0	$956	$6,416	$810	$206	$0	$0	$8,500
SUBTOTAL	0	0	203	2367	924	3628	0	0	7122	$0	$0	$1,066	$12,427	$2,957	$9,977	$0	$0	$26,500
TOTAL	0	0	246	2505	1274	6288	0	0	10313	$0	$0	$1,690	$14,359	$7,332	$43,227	$0	$0	$66,700
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 4.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	307	62	10	0	0	0	379	$0	$0	$8,903	$1,736	$250	$0	$0	$0	$10,900
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0									
SUBTOTAL	0	0	307	62	10	0	0	0	379	$0	$0	$8,903	$1,736	$250	$0	$0	$0	$10,900
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	315	14	0	0	0	329	$0	$0	$0	$3,388	$990	$0	$0	$0	$3,400
INSIDE DAUPHIN ISLAND BAY	0	0	149	198	5	0	0	0	352	$0	$0	$1,565	$2,079	$32	$0	$0	$0	$3,700
WEST OF DAUPHIN ISLAND BAY	0	0	1278	550	7	0	0	0	1835	$0	$0	$13,419	$5,775	$45	$0	$0	$0	$19,200
SUBTOTAL	0	0	1427	1063	26	0	0	0	2516	$0	$0	$14,984	$11,162	$167	$0	$0	$0	$26,300
TOTAL	0	0	1734	1125	36	0	0	0	2895	$0	$0	$23,887	$12,898	$417	$0	$0	$0	$37,200


2000 0 4000
SCALE IN FEET
MOBILE BAY
GULF INTRACOASTAL WATERWAY
LITTLE DAUPHIN ISLAND
DAUPHIN ISLAND BAY
BILLY GOAT HOLE BERTHING AREA
CONDOMINIUM BERTHING AREA
DAUPHIN ISLAND
GULF OF MEXICO
DAUPHIN ISLAND BRIDGE
MARINA BERTHING AREA
ALOE BAY
ALOE BAY BERTHING AREA
MISSISSIPPI SOUND
N
DAUPHIN ISLAND, ALABAMA
GOVERNMENT CUT
DAUPHIN ISLAND
BERTHING AREAS
FIGURE 2

The typical characteristics of the transient shrimping fleet (approximately 50 different vessels per week) were estimated by Mobile District because the vessels that use the berthing areas vary in size and draft weekly. The number of the vessels in the transient fleet and associated berthing locations were estimated, based on field interviews. Twenty-nine vessels are located in the western berthing area. The remainder of the transient vessels (21) are located in the southeast basin. The distribution of drafts for each basin's transient fleet is estimated as follows:

COMPOSITION TRANSIENT FLEET, BY DRAFT

DISTRIBUTION TRANSIENT FLEET DRAFT	PERCENT	TRANSIENT FLEET USAGE DRAFT	PERCENT
6.0'+	39%	6.0'+	0%
5.0'	38%	5.0'	19%
4.0'	15%	4.0'	100%
3.0'	08%	3.0'	100%

The annual trips of the transient vessels that would use the project were estimated to be comparable to the surveyed local shrimping vessels (1 trip per week) and numbered 676 for the fleet berthed west of Dauphin Island (13) and 468 for the vessels berthed southeast (9).

The number of the local shrimping vessels and their annual trips (8 X 52) berthed west of Dauphin Island, in Aloe Bay, and (7 X 52) berthed southeast, in Billy Goat Hole, was derived from field data. None of the vessels berthed west of Dauphin Island, in Aloe Bay, are estimated to use the project because of the bridge constraint, while all seven (7) vessels in Billy Goat Hole would make trips with adequate depth provided by high tide or project deepening (364). The remaining 22 non-recreational vessels are a mixture of charter, oil rig, and government vessels. Vessel counts and annual trips are based on a July, 1988 field survey. The annual trips varied from 20 to 1,460 per boat. Of the vessels on Table 2 which could use the project, three vessels are berthed south of Dauphin Island (810 trips), 14 are based inside Dauphin Island Bay (4,400 trips), and 2 boats are located west of Dauphin Island Bay (2,920 trips).

The costs shown in Table 5 were determined by multiplying the vessel's hourly variable operating cost by the round trip travel time used in each route. Travel time is one-half an hour using the with-project route (5 miles) at a slower speed, versus, one hour to travel around Little Dauphin Island (18 miles). Commercial vessels variable operating costs were based on comparable drafting shrimp boats in Mississippi. These commercial variable operating costs came from information supplied in The Draft Report on Commercial Fishing Cost Return Profiles for Gulf Coast Areas, January 1985 written by Centaur Associates, Inc. Commercial vessels are estimated to have an hourly variable operating cost of $10.50 for vessels drafting 5.0 foot or greater, $6.40 for 4.0 foot vessels, and, $5.50 for 3.0 foot vessels.

Table 3 displays these operating costs. Vessels using the project route used (one-half of the variable operating hourly cost) or one-half the time of the current route's trip of one hour. The recreational vessels variable operating costs were based on a telephone survey of local yacht dealers estimate of fuel consumption. Recreational vessels drafting 6.0+ feet were estimated to consume 29 gallons of fuel per hour. Vessels drafting 5.0, 4.0, and 3.0 foot were estimated to use 28, 25, and 25 gallons of fuel hourly. The fuel cost was estimated from a local marina during August, 1988 to be $1.00 per gallon ($.91 gas and $.09 oil).

Under existing conditions, the total cost for the 405 vessels that could use the project (making 13,208 trips annually) is approximately $103,800. Of these 13,208 trips, 10,313 trips use the project route at a cost of $66,700 and 2,895 trips are rerouted at a cost of $37,200. Table 4 displays the existing condition commercial and recreational vessel annual trips and the variable operating costs of the 405 vessels in Table 2.

Under the without-project future condition, the existing condition fleet will increase over the next 20 years. It was assumed that number of commercial vessels would increase six tenths of a percent and the recreational vessels would grow by six percent yearly (simple growth) after project completion in 1990. This growth was based on interviews from knowledgeable sources during a follow-up telephone survey.

The only change in the existing condition and without project future condition is the growth of the fleet. It was assumed that the composition of the fleet and the number of trips per boat would remain constant. The route and number of the trips; on Tables 5, 6, and 7; was determined by the probability of available navigable depth at 4.0 feet which is shown on Table 3 and was discussed under existing conditions.

Tables 6, 7, and 8 display the fleets' ability to navigate the existing 4.0 foot channel 1, 10, and 20 years during which a project could be completed. It is estimated that annual vessel trips will increase from 13,208 trips to 13,398 in 1990 (year 1). Table 6 shows 2,915 trips rerouted because of inadequate depth. Table 7 displays the trips occurring in the year 2000. In 2000 (year 10), 15,100 trips are estimated to occur. Of those 15,100 total trips, 3,089 trips are estimated to be rerouted around Little Dauphin Island. Table 8 represents the time frame between the years 2010 and 2039. During this period (years 20 to 50); 17,096 total trips are expected to take place with 3,317 of the trips to be rerouted.

The fleet's total variable operating costs is expected to increase from $103,800 under existing conditions to $106,500 in year 1, $130,300 in year 10, and stabilize in year 20 at $157,500 annually. Within the above total variable operating cost, the rerouted variable operating cost rerouted totals $37,000 in year 1, $42,800 in year 10, and $48,700 in the years 20-50. The average annual variable operating cost for all the vessels that would use the 4.0 foot channel is $130,600. Eighty-seven thousand seven hundred dollars of that operating cost is from trips using the project and $42,900 is from vessel trips rerouted.
Table 6

TABLE 6
GOVERNMENT CUT CHANNEL WITH 4.0 FOOT AT MLW
WITHOUT PROJECT FUTURE CONDITION YR 1

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH:ADEQUATE TIDE: 4.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	376	210	380	2800	0	0	3760	$0	$0	$10,063	$3,050	$4,875	$35,000	$0	$0	$53,000
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	376	210	380	2800	0	0	3760	$0	$0	$9,396	$1,820	$250	$0	$0	$0	$53,000
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$6,999	$1,709	$206	$0	$0	$9,000
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$1,675	$4,400	$560	$9,405	$0	$0	$16,000
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$14,375	$12,191	$855	$286	$0	$0	$27,700
SUBTOTAL	0	0	1630	3430	950	3620	0	0	9638	$0	$0	$16,050	$23,589	$3,124	$9,977	$0	$0	$52,700
TOTAL	0	0	2000	3640	1330	6420	0	0	13398	$0	$0	$25,446	$25,409	$3,374	$9,977	$0	$0	$106,500
VESSEL FEDERAL CUT USE WITH TIDE: 4.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	46	145	370	2800	0	0	3361	$0	$0	$667	$2,030	$4,625	$35,000	$0	$0	$42,300
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0									
SUBTOTAL	0	0	46	145	370	2800	0	0	3361	$0	$0	$667	$2,030	$4,625	$35,000	$0	$0	$42,300
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	703	506	104	0	0	1313	$0	$0	$0	$3,691	$1,619	$286	$0	$0	$5,600
INSIDE DAUPHIN ISLAND BAY	0	0	21	442	165	3420	0	0	4048	$0	$0	$110	$2,321	$520	$9,405	$0	$0	$12,400
WEST OF DAUPHIN ISLAND BAY	0	0	182	1222	253	104	0	0	1761	$0	$0	$956	$6,416	$810	$286	$0	$0	$8,500
SUBTOTAL	0	0	203	2367	924	3620	0	0	7122	$0	$0	$1,066	$12,427	$2,957	$9,977	$0	$0	$26,500
TOTAL	0	0	249	2512	3294	6420	0	0	10483	$0	$0	$1,733	$14,457	$7,582	$44,977	$0	$0	$68,800
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 4.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	324	65	10	0	0	0	399	$0	$0	$9,396	$1,820	$250	$0	$0	$0	$11,500
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0									
SUBTOTAL	0	0	324	65	10	0	0	0	399	$0	$0	$9,396	$1,820	$250	$0	$0	$0	$11,500
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	315	14	0	0	0	329	$0	$0	$0	$3,300	$990	$0	$0	$0	$3,400
INSIDE DAUPHIN ISLAND BAY	0	0	149	198	5	0	0	0	352	$0	$0	$1,565	$2,079	$32	$0	$0	$0	$3,700
WEST OF DAUPHIN ISLAND BAY	0	0	1278	550	7	0	0	0	1835	$0	$0	$13,419	$5,775	$45	$0	$0	$0	$19,200
SUBTOTAL	0	0	1427	1063	26	0	0	0	2516	$0	$0	$14,984	$11,162	$167	$0	$0	$0	$26,300
TOTAL	0	0	1751	1128	36	0	0	0	2915	$0	$0	$24,380	$12,982	$417	$0	$0	$0	$37,800

TABLE 7
PROJECT VESSEL TRIPS WITH 4.0 FOOT AT MLW
WITHOUT PROJECT FUTURE CONDITION YR 10

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 4.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	530	380	550	4030	0	0	5410	$0	$0	$16,413	$5,502	$7,063	$50,380	$0	$0	$77,400
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	530	380	550	4030	0	0	5410	$0	$0	$13,456	$2,604	$375	$25	$0	$0	$77,400
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$6,999	$1,709	$286	$0	$0	$9,000
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$1,675	$4,400	$560	$9,485	$0	$0	$16,000
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	156	0	0	3648	$0	$0	$14,375	$12,191	$855	$429	$0	$0	$27,900
SUBTOTAL	0	0	1630	3430	950	3680	0	0	9690	$0	$0	$16,050	$23,589	$3,124	$10,120	$0	$0	$52,900
TOTAL	0	0	2160	3730	1500	7710	0	0	15100	$0	$0	$29,506	$26,193	$3,499	$10,145	$0	$0	$130,300
VESSEL FEDERAL CUT USE WITH TIDE: 4.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	66	207	535	4029	0	0	4837	$0	$0	$957	$2,098	$6,688	$50,363	$0	$0	$60,900
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0									
SUBTOTAL	0	0	66	207	535	4029	0	0	4837	$0	$0	$957	$2,098	$6,688	$50,363	$0	$0	$60,900
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	703	506	104	0	0	1313	$0	$0	$0	$3,691	$1,619	$286	$0	$0	$5,600
INSIDE DAUPHIN ISLAND BAY	0	0	21	442	165	3420	0	0	4048	$0	$0	$110	$2,321	$520	$9,485	$0	$0	$12,400
WEST OF DAUPHIN ISLAND BAY	0	0	182	1222	253	156	0	0	1813	$0	$0	$956	$6,416	$810	$429	$0	$0	$8,600
SUBTOTAL	0	0	203	2367	924	3680	0	0	7174	$0	$0	$1,066	$12,427	$2,957	$10,120	$0	$0	$26,600
TOTAL	0	0	269	2574	1459	7709	0	0	12011	$0	$0	$2,023	$15,325	$9,645	$60,183	$0	$0	$87,500
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 4.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	464	93	15	1	0	0	573	$0	$0	$13,456	$2,604	$375	$25	$0	$0	$16,500
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0									
SUBTOTAL	0	0	464	93	15	1	0	0	573	$0	$0	$13,456	$2,604	$375	$25	$0	$0	$16,500
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	315	14	0	0	0	329	$0	$0	$0	$3,308	$990	$0	$0	$0	$3,400
INSIDE DAUPHIN ISLAND BAY	0	0	149	198	5	0	0	0	352	$0	$0	$1,565	$2,079	$32	$0	$0	$0	$3,700
WEST OF DAUPHIN ISLAND BAY	0	0	1278	550	7	0	0	0	1835	$0	$0	$13,419	$5,775	$45	$0	$0	$0	$19,200
SUBTOTAL	0	0	1427	1063	26	0	0	0	2516	$0	$0	$14,984	$11,162	$167	$0	$0	$0	$26,300
TOTAL	0	0	1891	1156	41	1	0	0	3089	$0	$0	$28,440	$13,766	$542	$25	$0	$0	$42,800

TABLE 8
PROJECT VESSEL TRIPS WITH 4.0 FOOT AT MLW
WITHOUT PROJECT FUTURE CONDITION YR 20-50

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 4.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	710	400	730	5410	0	0	7250	$0	$0	$19,314	$7,336	$9,375	$67,638	$0	$0	$103,700
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	710	400	730	5410	0	0	7250	$0	$0	$18,038	$3,472	$500	$25	$0	$0	$103,700
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1070	572	104	0	0	1746	$0	$0	$0	$7,361	$1,078	$286	$0	$0	$9,500
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$1,675	$4,400	$560	$9,405	$0	$0	$16,000
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1824	268	156	0	0	3708	$0	$0	$14,375	$12,568	$855	$429	$0	$0	$28,200
SUBTOTAL	0	0	1630	3534	1082	3680	0	0	9846	$0	$0	$16,050	$24,308	$3,293	$10,120	$0	$0	$53,000
TOTAL	0	0	2340	3934	1732	9090	0	0	17096	$0	$0	$34,088	$27,708	$3,793	$10,145	$0	$0	$157,500
VESSEL FEDERAL CUT USE WITH TIDE: 4.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	88	276	710	5409	0	0	6483	$0	$0	$1,276	$3,864	$8,875	$67,613	$0	$0	$81,600
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0									
SUBTOTAL	0	0	88	276	710	5409	0	0	6483	$0	$0	$1,276	$3,864	$8,875	$67,613	$0	$0	$81,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	738	557	104	0	0	1399	$0	$0	$0	$3,875	$1,782	$286	$0	$0	$5,900
INSIDE DAUPHIN ISLAND BAY	0	0	21	442	165	3420	0	0	4048	$0	$0	$110	$2,321	$528	$9,405	$0	$0	$12,400
WEST OF DAUPHIN ISLAND BAY	0	0	182	1250	253	156	0	0	1849	$0	$0	$956	$6,605	$810	$429	$0	$0	$8,800
SUBTOTAL	0	0	203	2430	975	3680	0	0	7296	$0	$0	$1,066	$12,800	$3,120	$10,120	$0	$0	$27,100
TOTAL	0	0	291	2714	1685	9089	0	0	13779	$0	$0	$2,342	$16,664	$11,995	$77,733	$0	$0	$108,700
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 4.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	622	124	20	1	0	0	767	$0	$0	$18,038	$3,472	$500	$25	$0	$0	$22,000
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0									
SUBTOTAL	0	0	622	124	20	1	0	0	767	$0	$0	$18,038	$3,472	$500	$25	$0	$0	$22,000
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	332	15	0	0	0	347	$0	$0	$0	$3,486	$96	$0	$0	$0	$3,600
INSIDE DAUPHIN ISLAND BAY	0	0	149	198	5	0	0	0	352	$0	$0	$1,565	$2,879	$32	$0	$0	$0	$3,700
WEST OF DAUPHIN ISLAND BAY	0	0	1278	566	7	0	0	0	1851	$0	$0	$13,419	$5,943	$45	$0	$0	$0	$19,400
SUBTOTAL	0	0	1427	1096	27	0	0	0	2550	$0	$0	$14,984	$11,508	$173	$0	$0	$0	$26,700
TOTAL	0	0	2049	1220	47	1	0	0	3317	$0	$0	$33,022	$14,980	$673	$25	$0	$0	$48,700

With-Project Condition

Four channel alternatives were considered for the Government Cut channel. The with-project conditions evaluated dredging by one foot increments and considered depths from 5.0 to 8.0 feet MLW. Tables 9 through 24 display the vessel annual trips and the total variable operating cost for the vessels using the 5.0, 6.0, 7.0 and 8.0 foot channels under no growth and future conditions. The no growth condition was the basis for estimating the future with project condition growth of vessel trips. The with project future condition trips represent vessel growth over a period of time when a project would be in place. Also shown on Tables 9 through 24 are the remaining vessel trips that the channel depth does not accommodate, the total vessel trips, and the respective annual variable costs for those two categories of trips.

The benefits to each of the alternatives are based on the vessel's ability to navigate the deepened channel with high tides (percent availability) and the reduction of the variable operating costs (travel time) of the re-routed trips. Table 4, shifted upward to the appropriate channel depth, determined the probability of the vessel trips (by draft) using the alternative channels. The annual variable operating and trips costs reduced for the four alternative under the no growth and without-project future conditions are shown by berthing area for commercial and recreational vessels, by draft for each foot of proposed channel depth.

Tables 9 through 12, Alternative 1 under no growth conditions, shows 12,491 of the 13,208 total trips routed through the Government Cut route with 5.0 feet at MLW. The annual variable operating costs of the total trips declined from $103,800, under the 4.0 foot channel, to $90,000 with Alternative 1. The alternative, under the future conditions, shows average annual vessel trips using government cut to total 14,360 of the 15,137 total trips. Average annual variable operating costs totaled $114,700 for this 5.0 foot channel versus $130,600 under the 4.0 foot channel. Benefits for this plan totalled $15,800. The 3100 trips re-routed around Little Dauphin Island under the without project condition were reduced to 776 with plan. The percent availability of high tide for vessel trips for a 5.0 foot channel for vessels drafting between 7.0 and 2.0 feet (Table 4 shifted upward 1 foot) is 12.45%, 68.99% 97.24%, 100.00%, and 100.00%. Of the 776 annual trips still re-routed, 173 trips were made by recreational vessels and 603 trips were commercial or other non-recreational craft.

TABLE 9
GOVERNMENT CUT CHANNEL WITH 5.0 FOOT AT MLW
NO GROWTH

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 5.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	350	200	360	2660	0	0	3570	$0	$0	$6,656	$2,884	$4,500	$33,250	$0	$0	$47,300
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	350	200	360	2660	0	0	3570	$0	$0	$3,161	$160	$0	$0	$0	$0	$47,300
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,492	$1,664	$286	$0	$0	$7,400
INSIDE DAUPHIN ISLAND BAY	0	0	170	649	170	3420	0	0	4408	$0	$0	$1,171	$3,460	$544	$9,405	$0	$0	$14,600
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$10,044	$9,561	$832	$286	$0	$0	$20,700
SUBTOTAL	0	0	1630	3430	950	3628	0	0	9638	$0	$0	$11,215	$18,513	$3,040	$9,977	$0	$0	$42,700
TOTAL	0	0	1980	3630	1310	6288	0	0	13200	$0	$0	$14,376	$18,681	$3,040	$9,977	$0	$0	$90,000
VESSEL FEDERAL CUT USE WITH TIDE: 5.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	241	194	360	2660	0	0	3455	$0	$0	$3,495	$2,716	$4,500	$33,250	$0	$0	$44,000
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	241	194	360	2660	0	0	3455	$0	$0	$3,495	$2,716	$4,500	$33,250	$0	$0	$44,000
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	990	520	104	0	0	1614	$0	$0	$0	$5,190	$1,664	$286	$0	$0	$7,100
INSIDE DAUPHIN ISLAND BAY	0	0	117	621	170	3420	0	0	4328	$0	$0	$614	$3,260	$544	$9,405	$0	$0	$13,800
WEST OF DAUPHIN ISLAND BAY	0	0	1007	1723	260	104	0	0	3094	$0	$0	$5,287	$9,046	$832	$286	$0	$0	$15,500
SUBTOTAL	0	0	1124	3334	950	3628	0	0	9036	$0	$0	$5,901	$17,504	$3,040	$9,977	$0	$0	$36,400
TOTAL	0	0	1365	3528	1310	6288	0	0	12491	$0	$0	$9,396	$20,220	$7,540	$43,227	$0	$0	$80,400
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 5.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	109	6	0	0	0	0	115	$0	$0	$3,161	$160	$0	$0	$0	$0	$3,300
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	109	6	0	0	0	0	115	$0	$0	$3,161	$160	$0	$0	$0	$0	$3,300
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	28	0	0	0	0	28	$0	$0	$0	$294	$0	$0	$0	$0	$300
INSIDE DAUPHIN ISLAND BAY	0	0	53	19	0	0	0	0	72	$0	$0	$557	$200	$0	$0	$0	$0	$800
WEST OF DAUPHIN ISLAND BAY	0	0	453	49	0	0	0	0	502	$0	$0	$4,757	$515	$0	$0	$0	$0	$5,300
SUBTOTAL	0	0	506	96	0	0	0	0	602	$0	$0	$5,314	$1,009	$0	$0	$0	$0	$6,400
TOTAL	0	0	615	102	0	0	0	0	717	$0	$0	$8,475	$1,177	$0	$0	$0	$0	$9,700

TABLE 10
GOVERNMENT CUT CHANNEL WITH 5.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION TR 1

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 5.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	370	210	300	2000	0	0	3760	$0	$0	$7,033	$3,024	$8,750	$35,000	$0	$0	$49,000
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	370	210	300	2000	0	0	3760	$0	$0	$3,335	$160	$0	$0	$0	$0	$49,000
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,492	$1,664	$286	$0	$0	$7,400
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$1,171	$3,060	$550	$9,405	$0	$0	$14,600
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$10,044	$9,561	$832	$286	$0	$0	$20,700
SUBTOTAL	0	0	1630	3430	950	3628	0	0	9638	$0	$0	$11,215	$18,513	$3,040	$9,977	$0	$0	$42,700
TOTAL	0	0	2000	3640	1330	6428	0	0	13398	$0	$0	$14,550	$18,681	$3,040	$9,977	$0	$0	$92,500
VESSEL FEDERAL CUT USE WITH TIDE: 5.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	255	204	300	2000	0	0	3639	$0	$0	$3,698	$2,856	$8,750	$35,000	$0	$0	$46,300
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	255	204	300	2000	0	0	3639	$0	$0	$3,698	$2,856	$8,750	$35,000	$0	$0	$46,300
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	990	520	104	0	0	1614	$0	$0	$0	$5,190	$1,664	$286	$0	$0	$7,100
INSIDE DAUPHIN ISLAND BAY	0	0	117	621	170	3420	0	0	4328	$0	$0	$614	$3,260	$550	$9,405	$0	$0	$13,800
WEST OF DAUPHIN ISLAND BAY	0	0	1007	1723	260	104	0	0	3094	$0	$0	$5,287	$9,046	$832	$286	$0	$0	$15,500
SUBTOTAL	0	0	1124	3334	950	3628	0	0	9036	$0	$0	$5,901	$17,504	$3,040	$9,977	$0	$0	$36,400
TOTAL	0	0	1379	3538	1330	6428	0	0	12675	$0	$0	$9,599	$20,360	$7,790	$44,977	$0	$0	$82,700
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 5.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	115	6	0	0	0	0	121	$0	$0	$3,335	$160	$0	$0	$0	$0	$3,500
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	115	6	0	0	0	0	121	$0	$0	$3,335	$160	$0	$0	$0	$0	$3,500
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	20	0	0	0	0	20	$0	$0	$0	$294	$0	$0	$0	$0	$300
INSIDE DAUPHIN ISLAND BAY	0	0	53	19	0	0	0	0	72	$0	$0	$557	$200	$0	$0	$0	$0	$800
WEST OF DAUPHIN ISLAND BAY	0	0	453	49	0	0	0	0	502	$0	$0	$4,757	$515	$0	$0	$0	$0	$5,300
SUBTOTAL	0	0	506	96	0	0	0	0	602	$0	$0	$5,314	$1,009	$0	$0	$0	$0	$6,400
TOTAL	0	0	621	102	0	0	0	0	723	$0	$0	$8,649	$1,177	$0	$0	$0	$0	$9,900

TABLE II
PROJECT VESSEL TRIPS WITH 5.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION YR 10

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 5.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	530	300	550	4030	0	0	5410	$0	$0	$10,070	$4,312	$6,875	$50,375	$0	$0	$71,600
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	530	300	550	4030	0	0	5410	$0	$0	$4,785	$224	$0	$0	$0	$0	$71,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,492	$1,664	$206	$0	$0	$7,400
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3620	0	0	4400	$0	$0	$1,171	$3,460	$544	$9,405	$0	$0	$14,600
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	156	0	0	3648	$0	$0	$10,044	$9,561	$832	$429	$0	$0	$20,900
SUBTOTAL	0	0	1630	3430	950	3680	0	0	9690	$0	$0	$11,215	$18,513	$3,040	$10,120	$0	$0	$42,900
TOTAL	0	0	2160	3730	1500	7710	0	0	15100	$0	$0	$16,000	$18,737	$3,040	$10,120	$0	$0	$114,500
VESSEL FEDERAL CUT USE WITH TIDE: 5.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	365	292	550	4030	0	0	5237	$0	$0	$5,293	$4,088	$6,875	$50,375	$0	$0	$66,600
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	365	292	550	4030	0	0	5237	$0	$0	$5,293	$4,088	$6,875	$50,375	$0	$0	$66,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	990	520	104	0	0	1614	$0	$0	$0	$5,190	$1,664	$206	$0	$0	$7,100
INSIDE DAUPHIN ISLAND BAY	0	0	117	621	170	3420	0	0	4328	$0	$0	$614	$3,260	$544	$9,405	$0	$0	$13,800
WEST OF DAUPHIN ISLAND BAY	0	0	1007	1723	260	156	0	0	3146	$0	$0	$5,287	$9,046	$832	$429	$0	$0	$15,600
SUBTOTAL	0	0	1124	3334	950	3680	0	0	9088	$0	$0	$5,901	$17,504	$3,040	$10,120	$0	$0	$36,500
TOTAL	0	0	1489	3626	1500	7710	0	0	14325	$0	$0	$11,194	$21,592	$9,915	$60,495	$0	$0	$103,100
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 5.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	165	8	0	0	0	0	173	$0	$0	$4,785	$224	$0	$0	$0	$0	$5,000
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	165	8	0	0	0	0	173	$0	$0	$4,785	$224	$0	$0	$0	$0	$5,000
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	20	0	0	0	0	20	$0	$0	$0	$294	$0	$0	$0	$0	$300
INSIDE DAUPHIN ISLAND BAY	0	0	53	19	0	0	0	0	72	$0	$0	$557	$200	$0	$0	$0	$0	$800
WEST OF DAUPHIN ISLAND BAY	0	0	453	49	0	0	0	0	502	$0	$0	$4,757	$515	$0	$0	$0	$0	$5,300
SUBTOTAL	0	0	506	96	0	0	0	0	602	$0	$0	$5,314	$1,009	$0	$0	$0	$0	$6,400
TOTAL	0	0	671	104	9	0	0	0	775	$0	$0	$10,099	$1,233	$0	$0	$0	$0	$11,400

TABLE 12
PROJECT VESSEL TRIPS WITH 5.0 FOOT LT MLW
WITH PROJECT FUTURE CONDITION YR 20-50

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 5.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	710	400	730	5410	0	0	7250	$0	$0	$13,500	$5,750	$9,125	$67,625	$0	$0	$96,000
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	710	400	730	5410	0	0	7250	$0	$0	$6,409	$300	$0	$0	$0	$0	$96,000
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1070	572	104	0	0	1746	$0	$0	$0	$5,770	$1,030	$206	$0	$0	$7,900
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$1,171	$3,460	$544	$9,405	$0	$0	$14,600
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1024	260	156	0	0	3700	$0	$0	$10,044	$9,039	$832	$429	$0	$0	$21,100
SUBTOTAL	0	0	1630	3534	1002	3680	0	0	9846	$0	$0	$11,215	$19,069	$3,206	$10,120	$0	$0	$43,600
TOTAL	0	0	2340	3934	1732	9090	0	0	17096	$0	$0	$17,624	$19,377	$3,206	$10,120	$0	$0	$139,600
VESSEL FEDERAL CUT USE WITH TIDE: 5.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	489	389	730	5410	0	0	7018	$0	$0	$7,091	$5,446	$9,125	$67,625	$0	$0	$89,300
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	489	389	730	5410	0	0	7018	$0	$0	$7,091	$5,446	$9,125	$67,625	$0	$0	$89,300
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1041	572	104	0	0	1717	$0	$0	$0	$5,665	$1,030	$206	$0	$0	$7,600
INSIDE DAUPHIN ISLAND BAY	0	0	117	621	170	3420	0	0	4328	$0	$0	$614	$3,260	$544	$9,405	$0	$0	$13,800
WEST OF DAUPHIN ISLAND BAY	0	0	1007	1774	269	156	0	0	3197	$0	$0	$5,287	$9,314	$832	$429	$0	$0	$15,900
SUBTOTAL	0	0	1124	3436	1002	3680	0	0	9242	$0	$0	$5,901	$18,039	$3,206	$10,120	$0	$0	$37,300
TOTAL	0	0	1613	3825	1732	9090	0	0	16260	$0	$0	$12,992	$23,485	$12,331	$77,745	$0	$0	$126,600
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 5.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	6	221	11	0	0	0	0	232	$0	$0	$6,409	$300	$0	$0	$0	$0	$6,700
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	221	11	0	0	0	0	232	$0	$0	$6,409	$300	$0	$0	$0	$0	$6,700
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	29	0	0	0	0	29	$0	$0	$0	$305	$0	$0	$0	$0	$300
INSIDE DAUPHIN ISLAND BAY	0	0	53	19	0	0	0	0	72	$0	$0	$557	$200	$0	$0	$0	$0	$800
WEST OF DAUPHIN ISLAND BAY	0	0	453	50	0	0	0	0	503	$0	$0	$4,757	$525	$0	$0	$0	$0	$5,300
SUBTOTAL	0	0	506	98	0	0	0	0	604	$0	$0	$5,314	$1,030	$0	$0	$0	$0	$6,400
TOTAL	0	0	727	109	0	0	0	0	836	$0	$0	$11,723	$1,330	$0	$0	$0	$0	$13,100

Tables 13 through 16, Alternative 2, shows 13,154 total trips using the Government Cut channel at 6.0 foot MLW and it's route under no growth conditions. The sum of the variable operating cost of all of the vessels is estimated to be $85,600. Under the with project future conditions, average annual total trips, using a 6.0 foot channel, numbered 15,077. The average annual variable operating cost for the total fleet summed to $109,500. Aggregate annual benefits are $21,000. The annual incremental benefit to the plan is $5,200 ($21,000 - $15,800). Fifty nine annual trips will continue to be routed around Little Dauphin Island under this scenario, including 14 recreational and 45 commercial vessel trips. The percent availability of high tide for vessel trips for a 6.0 foot channel for vessels drafting between 7.0 and 2.0 feet is 68.99%, 97.24%, 99.98%, 1.00%, 100.00%, and 100.00%.

Tables 17 through 24, Alternatives 3 and 4, show that all of the vessels have the ability to navigate the project and can use the shorter route through Dauphin Island Bay. The total average annual variable operating cost to the vessel under these plans is $109,100 annually. The annual benefit is $21,500, or an incremental annual savings of $500 and $0 for the projects with 7.0 and 8.0 foot depths (21,500 - $21,000) and ($21,500-$21-500).

Table 25 is a summary table displaying total commercial and recreational vessels usage by route. This table also shows the annual trips and variable operating costs over time in relation to the existing and alternative channelization. The annual trips are broken out between usage (recreational or commercial) and the vessels ability to navigate the channel under varying depths between 4 and 8 feet (Federal cut use versus re-routing around Little Dauphin Island). The average annual operating costs and trips are displayed in the final column of Table 25.

Conclusions

A summary of the without-project condition and the four plans, by foot of channel depth, is shown on Table 26: Benefits to Alternatives. The without-project future annual variable cost for the study area (three basins) totals $130,600 Alternatives 1, 2, 3, and 4 (5.0 through 8.0 foot channels) show variable operating costs declining as the various drafting vessels are able to utilize the project route. The variable operating cost for alternative 1 is $114,700, alternative 2 is $109,500, and, alternatives 3 + 4 are $109,100. Benefits (costs reduced from the without project condition) to the various alternatives total $15,800, $21,000, $21,500 and $21,500. Table 27 shows the average annual benefits to each of the alternatives, their average annual costs, the net benefits, and, the benefit to cost ratio. The National Economic Development (NED) plan is the alternative with the greatest net benefits to the Nation. The NED plan is the recommended plan and is alternative 2, a 6.0 foot channel. This plan has the largest net benefits and has a benefit to cost ratio of 1.11 to 1.0.

TABLE 13
GOVERNMENT CUT CHANNEL WITH 6.0 FOOT AT MLW
NO GROWTH

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 6.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	350	200	360	2660	0	0	3570	$0	$0	$5,206	$2,860	$4,500	$33,250	$0	$0	$45,800
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	350	200	360	2660	0	0	3570	$0	$0	$261	$0	$0	$0	$0	$0	$45,800
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$919	$3,360	$544	$9,485	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$7,875	$9,303	$832	$286	$0	$0	$16,300
SUBTOTAL	0	0	1630	3430	950	3628	0	0	9638	$0	$0	$8,794	$18,008	$3,040	$9,977	$0	$0	$39,800
TOTAL	0	0	1980	3630	1310	6288	0	0	13208	$0	$0	$9,055	$18,008	$3,040	$9,977	$0	$0	$85,600
VESSEL FEDERAL CUT USE WITH TIDE: 6.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	341	200	360	2660	0	0	3561	$0	$0	$4,945	$2,800	$4,500	$33,250	$0	$0	$45,500
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	341	200	360	2660	0	0	3561	$0	$0	$4,945	$2,800	$4,500	$33,250	$0	$0	$45,500
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	165	640	170	3420	0	0	4395	$0	$0	$866	$3,360	$544	$9,485	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1420	1772	260	104	0	0	3556	$0	$0	$7,455	$9,303	$832	$286	$0	$0	$17,900
SUBTOTAL	0	0	1585	3430	950	3628	0	0	9593	$0	$0	$8,321	$18,008	$3,040	$9,977	$0	$0	$39,400
TOTAL	0	0	1926	3630	1310	6288	0	0	13154	$0	$0	$13,266	$20,808	$7,540	$43,227	$0	$0	$84,900
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 6.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	9	0	0	0	0	0	9	$0	$0	$261	$0	$0	$0	$0	$0	$300
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	9	0	0	0	0	0	9	$0	$0	$261	$0	$0	$0	$0	$0	$300
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	5	0	0	0	0	0	5	$0	$0	$53	$0	$0	$0	$0	$0	$100
WEST OF DAUPHIN ISLAND BAY	0	0	40	0	0	0	0	0	40	$0	$0	$420	$0	$0	$0	$0	$0	$500
SUBTOTAL	0	0	45	0	0	0	0	0	45	$0	$0	$473	$0	$0	$0	$0	$0	$500
TOTAL	0	0	54	0	0	0	0	0	54	$0	$0	$734	$0	$0	$0	$0	$0	$800

TABLE 14
GOVERNMENT CUT CHANNEL WITH 6.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION YR 1

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 6.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	370	210	300	2800	0	0	3760	$0	$0	$5,510	$2,940	$4,750	$35,000	$0	$0	$48,200
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	370	210	300	2800	0	0	3760	$0	$0	$290	$0	$0	$0	$0	$0	$48,200
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$919	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$7,875	$9,303	$832	$286	$0	$0	$18,300
SUBTOTAL	0	0	1630	3430	950	3620	0	0	9638	$0	$0	$8,794	$18,008	$3,040	$9,977	$0	$0	$39,800
TOTAL	0	0	2000	3640	1330	6420	0	0	13398	$0	$0	$9,084	$18,008	$3,040	$9,977	$0	$0	$88,000
VESSEL FEDERAL CUT USE WITH TIDE: 6.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	360	210	300	2800	0	0	3750	$0	$0	$5,220	$2,940	$4,750	$35,000	$0	$0	$47,900
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	360	210	300	2800	0	0	3750	$0	$0	$5,220	$2,940	$4,750	$35,000	$0	$0	$47,900
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	165	640	170	3420	0	0	4395	$0	$0	$866	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1420	1772	260	104	0	0	3556	$0	$0	$7,455	$9,303	$832	$286	$0	$0	$17,900
SUBTOTAL	0	0	1585	3430	950	3620	0	0	9593	$0	$0	$8,321	$18,008	$3,040	$9,977	$0	$0	$39,400
TOTAL	0	0	1945	3640	1330	6420	0	0	13343	$0	$0	$13,541	$20,948	$7,790	$44,977	$0	$0	$87,300
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 6.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	10	0	0	0	0	0	10	$0	$0	$290	$0	$0	$0	$0	$0	$300
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	10	0	0	0	0	0	10	$0	$0	$290	$0	$0	$0	$0	$0	$300
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	5	0	0	0	0	0	5	$0	$0	$53	$0	$0	$0	$0	$0	$100
WEST OF DAUPHIN ISLAND BAY	0	0	40	0	0	0	0	0	40	$0	$0	$420	$0	$0	$0	$0	$0	$400
SUBTOTAL	0	0	45	0	0	0	0	0	45	$0	$0	$473	$0	$0	$0	$0	$0	$500
TOTAL	0	0	55	0	0	0	0	0	55	$0	$0	$763	$0	$0	$0	$0	$0	$800

TABLE 15
PROJECT VESSEL TRIPS WITH 6.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION IN 10

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 6.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	530	300	550	4030	0	0	5410	$0	$0	$7,888	$4,200	$6,875	$50,375	$0	$0	$69,300
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	530	300	550	4030	0	0	5410	$0	$0	$406	$0	$0	$0	$0	$0	$69,300
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$206	$0	$0	$7,200
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$919	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	156	0	0	3648	$0	$0	$7,875	$9,303	$832	$429	$0	$0	$18,400
SUBTOTAL	0	0	1630	3430	950	3680	0	0	9690	$0	$0	$8,794	$18,008	$3,040	$10,120	$0	$0	$40,000
TOTAL	0	0	2160	3730	1500	7710	0	0	15100	$0	$0	$9,200	$18,008	$3,040	$10,120	$0	$0	$109,300
VESSEL FEDERAL CUT USE WITH TIDE: 6.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	516	300	550	4030	0	0	5396	$0	$0	$7,402	$4,200	$6,875	$50,375	$0	$0	$68,900
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	516	300	550	4030	0	0	5396	$0	$0	$7,402	$4,200	$6,875	$50,375	$0	$0	$68,900
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$206	$0	$0	$7,200
INSIDE DAUPHIN ISLAND BAY	0	0	165	640	170	3420	0	0	4395	$0	$0	$866	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1420	1772	260	156	0	0	3608	$0	$0	$7,455	$9,303	$832	$429	$0	$0	$18,000
SUBTOTAL	0	0	1585	3430	950	3680	0	0	9645	$0	$0	$8,321	$18,008	$3,040	$10,120	$0	$0	$39,500
TOTAL	0	0	2101	3730	1500	7710	0	0	15041	$0	$0	$15,803	$22,208	$9,915	$60,495	$0	$0	$108,400
REDUCED VESSEL FEDERAL CUT USE WITH TIDE: 6.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	14	0	0	0	0	0	14	$0	$0	$406	$0	$0	$0	$0	$0	$400
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	14	0	0	0	0	0	14	$0	$0	$406	$0	$0	$0	$0	$0	$400
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	5	0	0	0	0	0	5	$0	$0	$53	$0	$0	$0	$0	$0	$100
WEST OF DAUPHIN ISLAND BAY	0	0	40	0	0	0	0	0	40	$0	$0	$420	$0	$0	$0	$0	$0	$400
SUBTOTAL	0	0	45	0	0	0	0	0	45	$0	$0	$473	$0	$0	$0	$0	$0	$500
TOTAL	0	0	59	0	0	0	0	0	59	$0	$0	$879	$0	$0	$0	$0	$0	$900

TABLE 16
PROJECT VESSEL TRIPS WITH 6.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION YR 20-50

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 6.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	710	400	730	5410	0	0	7250	$0	$0	$10,571	$5,600	$9,125	$67,625	$0	$0	$92,900
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	710	400	730	5410	0	0	7250	$0	$0	$551	$0	$0	$0	$0	$0	$92,900
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1070	572	104	0	0	1746	$0	$0	$0	$5,610	$1,030	$206	$0	$0	$7,700
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$919	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1824	260	156	0	0	3700	$0	$0	$7,875	$9,576	$832	$429	$0	$0	$18,700
SUBTOTAL	0	0	1630	3534	1002	3680	0	0	9846	$0	$0	$8,794	$18,556	$3,206	$10,120	$0	$0	$40,700
TOTAL	0	0	2340	3934	1732	9090	0	0	17096	$0	$0	$9,345	$18,556	$3,206	$10,120	$0	$0	$133,600
VESSEL PEDERAL CUT USE WITH TIDE: 6.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	691	400	730	5410	0	0	7231	$0	$0	$10,020	$5,600	$9,125	$67,625	$0	$0	$92,400
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	691	400	730	5410	0	0	7231	$0	$0	$10,020	$5,600	$9,125	$67,625	$0	$0	$92,400
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1070	572	104	0	0	1746	$0	$0	$0	$5,610	$1,030	$206	$0	$0	$7,700
INSIDE DAUPHIN ISLAND BAY	0	0	165	640	170	3420	0	0	4395	$0	$0	$866	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1420	1824	260	156	0	0	3660	$0	$0	$7,455	$9,576	$832	$429	$0	$0	$18,300
SUBTOTAL	0	0	1585	3534	1002	3680	0	0	9801	$0	$0	$8,321	$18,556	$3,206	$10,120	$0	$0	$40,200
TOTAL	0	0	2276	3934	1732	9090	0	0	17032	$0	$0	$10,381	$24,156	$12,331	$77,745	$0	$0	$132,600
REROUTED VESSEL PEDERAL CUT USE WITH TIDE: 6.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	19	0	0	0	0	0	19	$0	$0	$551	$0	$0	$0	$0	$0	$600
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	19	0	0	0	0	0	19	$0	$0	$551	$0	$0	$0	$0	$0	$600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	5	0	0	0	0	0	5	$0	$0	$53	$0	$0	$0	$0	$0	$100
WEST OF DAUPHIN ISLAND BAY	0	0	40	0	0	0	0	0	40	$0	$0	$420	$0	$0	$0	$0	$0	$400
SUBTOTAL	0	0	45	0	0	0	0	0	45	$0	$0	$473	$0	$0	$0	$0	$0	$500
TOTAL	0	0	64	0	0	0	0	0	64	$0	$0	$1,024	$0	$0	$0	$0	$0	$1,100

TABLE 17
PROJECT VESSEL TRIPS WITH 7.0 FOOT AT MLW
NO GROWTH

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 7.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	350	200	360	2660	0	0	3570	$0	$0	$5,075	$2,000	$4,500	$33,250	$0	$0	$45,600
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	350	200	360	2660	0	0	3570	$0	$0	$0	$0	$0	$0	$0	$0	$45,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1469	1772	260	104	0	0	3596	$0	$0	$7,665	$9,303	$832	$286	$0	$0	$18,100
SUBTOTAL	0	0	1638	3438	950	3628	0	0	9638	$0	$0	$8,558	$18,008	$3,040	$9,977	$0	$0	$39,600
TOTAL	0	0	1988	3638	1310	6288	0	0	13208	$0	$0	$8,558	$18,008	$3,040	$9,977	$0	$0	$85,200
VESSEL FEDERAL CUT USE WITH TIDE: 7.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	350	200	360	2660	0	0	3570	$0	$0	$5,075	$2,000	$4,500	$33,250	$0	$0	$45,600
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	350	200	360	2660	0	0	3570	$0	$0	$5,075	$2,000	$4,500	$33,250	$0	$0	$45,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1469	1772	260	104	0	0	3596	$0	$0	$7,665	$9,303	$832	$286	$0	$0	$18,100
SUBTOTAL	0	0	1638	3438	950	3628	0	0	9638	$0	$0	$8,558	$18,008	$3,040	$9,977	$0	$0	$39,600
TOTAL	0	0	1988	3638	1310	6288	0	0	13208	$0	$0	$13,633	$20,008	$7,540	$43,227	$0	$0	$85,200
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 7.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

TABLE 10
PROJECT VESSEL TRIPS WITH 7.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION YR 1

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 7.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	370	210	380	2800	0	0	3760	$0	$0	$5,365	$2,940	$4,750	$35,000	$0	$0	$48,100
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	370	210	380	2800	0	0	3760	$0	$0	$0	$0	$0	$0	$0	$0	$48,100
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,305	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$7,665	$9,303	$832	$286	$0	$0	$18,100
SUBTOTAL	0	0	1630	3430	950	3620	0	0	9630	$0	$0	$8,558	$18,000	$3,040	$9,977	$0	$0	$39,600
TOTAL	0	0	2000	3640	1330	6420	0	0	13390	$0	$0	$8,558	$18,000	$3,040	$9,977	$0	$0	$87,700
VESSEL FEDERAL CUT USE WITH TIDE: 7.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	370	210	380	2800	0	0	3760	$0	$0	$5,365	$2,940	$4,750	$35,000	$0	$0	$48,100
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	370	210	380	2800	0	0	3760	$0	$0	$5,365	$2,940	$4,750	$35,000	$0	$0	$48,100
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,305	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$7,665	$9,303	$832	$286	$0	$0	$18,100
SUBTOTAL	0	0	1630	3430	950	3620	0	0	9630	$0	$0	$8,558	$18,000	$3,040	$9,977	$0	$0	$39,600
TOTAL	0	0	2000	3640	1330	6420	0	0	13390	$0	$0	$13,923	$20,940	$7,790	$44,977	$0	$0	$87,700
REDUCED VESSEL FEDERAL CUT USE WITH TIDE: 7.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

TABLE 19
PROJECT VESSEL TRIPS WITH 7.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION YR 10

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 7.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	530	300	550	4030	0	0	5410	$0	$0	$7,605	$4,200	$6,875	$50,375	$0	$0	$69,100
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	530	300	550	4030	0	0	5410	$0	$0	$0	$0	$0	$0	$0	$0	$69,100
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,305	$1,664	$206	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	156	0	0	3648	$0	$0	$7,665	$9,303	$832	$429	$0	$0	$18,200
SUBTOTAL	0	0	1630	3430	950	3680	0	0	9690	$0	$0	$8,558	$18,008	$3,040	$10,120	$0	$0	$39,700
TOTAL	0	0	2160	3730	1500	7710	0	0	15100	$0	$0	$8,558	$18,008	$3,040	$10,120	$0	$0	$100,000
VESSEL FEDERAL CUT USE WITH TIDE: 7.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	530	300	550	4030	0	0	5410	$0	$0	$7,605	$4,200	$6,875	$50,375	$0	$0	$69,100
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	530	300	550	4030	0	0	5410	$0	$0	$7,605	$4,200	$6,875	$50,375	$0	$0	$69,100
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,305	$1,664	$206	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	156	0	0	3648	$0	$0	$7,665	$9,303	$832	$429	$0	$0	$18,200
SUBTOTAL	0	0	1630	3430	950	3680	0	0	9690	$0	$0	$8,558	$18,008	$3,040	$10,120	$0	$0	$39,700
TOTAL	0	0	2160	3730	1500	7710	0	0	15100	$0	$0	$16,243	$22,208	$9,915	$60,495	$0	$0	$100,000
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 7.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

TABLE 20
PROJECT VESSEL TRIPS WITH 7.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION YR 20-50

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 7.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	710	400	730	5410	0	0	7250	$0	$0	$10,295	$5,600	$9,125	$67,625	$0	$0	$92,600
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	710	400	730	5410	0	0	7256	$0	$0	$0	$0	$0	$0	$0	$0	$92,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1070	572	104	0	0	1746	$0	$0	$0	$5,618	$1,030	$286	$0	$0	$7,700
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1824	260	156	0	0	3700	$0	$0	$7,665	$9,576	$832	$429	$0	$0	$18,500
SUBTOTAL	0	0	1630	3534	1002	3680	0	0	9846	$0	$0	$8,558	$18,554	$3,206	$10,120	$0	$0	$40,400
TOTAL	0	0	2340	3934	1732	9090	0	0	17096	$0	$0	$8,558	$18,554	$3,206	$10,120	$0	$0	$133,000
VESSEL FEDERAL CUT USE WITH TIDE: 7.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	710	400	730	5410	0	0	7250	$0	$0	$10,295	$5,600	$9,125	$67,625	$0	$0	$92,600
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	710	400	730	5410	0	0	7250	$0	$0	$10,295	$5,600	$9,125	7,625	$0	$0	$92,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1070	572	104	0	0	1746	$0	$0	$0	$5,618	$1,030	$286	$0	$0	$7,700
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1824	260	156	0	0	3700	$0	$0	$7,665	$9,576	$832	$429	$0	$0	$18,500
SUBTOTAL	0	0	1630	3534	1002	3680	0	0	9846	$0	$0	$8,558	$18,554	$3,206	$10,120	$0	$0	$40,400
TOTAL	0	0	2340	3934	1732	9090	0	0	17096	$0	$0	$18,853	$24,154	$12,331	$77,745	$0	$0	$133,000
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 7.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

TABLE 21

PROJECT VESSEL TRIPS WITH 8.0 FOOT AT MLW

NO GROWTH

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 8.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	350	200	360	2660	0	0	3570	$0	$0	$5,075	$2,000	$4,500	$33,250	$0	$0	$45,600
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	350	200	360	2660	0	0	3570	$0	$0	$0	$0	$0	$0	$0	$0	$45,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$7,665	$9,303	$832	$286	$0	$0	$18,100
SUBTOTAL	0	0	1630	3430	950	3628	0	0	9638	$0	$0	$8,558	$18,008	$3,040	$9,977	$0	$0	$39,600
TOTAL	0	0	1980	3630	1310	6288	0	0	13288	$0	$0	$8,558	$18,008	$3,040	$9,977	$0	$0	$85,200
VESSEL FEDERAL CUT USE WITH TIDE: 8.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	350	200	360	2660	0	0	3570	$0	$0	$5,075	$2,000	$4,500	$33,250	$0	$0	$45,600
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	350	200	360	2660	0	0	3570	$0	$0	$5,075	$2,000	$4,500	$33,250	$0	$0	$45,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$7,665	$9,303	$832	$286	$0	$0	$18,100
SUBTOTAL	0	0	1630	3430	950	3628	0	0	9638	$0	$0	$8,558	$18,008	$3,040	$9,977	$0	$0	$39,600
TOTAL	0	0	1980	3630	1310	6288	0	0	13288	$0	$0	$13,633	$20,008	$7,540	$43,227	$0	$0	$85,200
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 8.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

TABLE 22
PROJECT VESSEL TRIPS WITH 8.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION IN 1

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 8.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	370	210	380	2800	0	0	3760	$0	$0	$5,365	$2,940	$4,750	$35,000	$0	$0	$48,100
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	370	210	380	2800	0	0	3760	$0	$0	$0	$0	$0	$0	$0	$0	$48,100
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$7,665	$9,303	$832	$286	$0	$0	$18,100
SUBTOTAL	0	0	1630	3430	950	3628	0	0	9638	$0	$0	$8,558	$18,008	$3,040	$9,977	$0	$0	$39,600
TOTAL	0	0	2000	3640	1330	6428	0	0	13398	$0	$0	$8,558	$18,008	$3,040	$9,977	$0	$0	$87,700
VESSEL FEDERAL CUT USE WITH TIDE: 8.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	370	210	380	2800	0	0	3760	$0	$0	$5,365	$2,940	$4,750	$35,000	$0	$0	$48,100
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	370	210	380	2800	0	0	3760	$0	$0	$5,365	$2,940	$4,750	$35,000	$0	$0	$48,100
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	104	0	0	3596	$0	$0	$7,665	$9,303	$832	$286	$0	$0	$18,100
SUBTOTAL	0	0	1630	3430	950	3628	0	0	9638	$0	$0	$8,558	$18,008	$3,040	$9,977	$0	$0	$39,600
TOTAL	0	0	2000	3640	1330	6428	0	0	13398	$0	$0	$13,923	$20,948	$7,790	$44,977	$0	$0	$87,700
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 8.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

TABLE 23
PROJECT VESSEL TRIPS WITH 8.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION IN 10

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 8.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	530	300	550	4030	0	0	5410	$0	$0	$7,685	$4,200	$6,875	$50,375	$0	$0	$69,100
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	530	300	550	4030	0	0	5410	$0	$0	$0	$0	$0	$0	$0	$0	$69,100
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	156	0	0	3648	$0	$0	$7,665	$9,303	$832	$429	$0	$0	$18,200
SUBTOTAL	0	0	1630	3430	950	3680	0	0	9690	$0	$0	$8,558	$18,008	$3,040	$10,120	$0	$0	$39,700
TOTAL	0	0	2160	3730	1500	7710	0	0	15100	$0	$0	$8,558	$18,008	$3,040	$10,120	$0	$0	$108,800
VESSEL FEDERAL CUT USE WITH TIDE: 8.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	530	300	550	4030	0	0	5410	$0	$0	$7,685	$4,200	$6,875	$50,375	$0	$0	$69,100
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	530	300	550	4030	0	0	5410	$0	$0	$7,685	$4,200	$6,875	$50,375	$0	$0	$69,100
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1010	520	104	0	0	1642	$0	$0	$0	$5,345	$1,664	$286	$0	$0	$7,300
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$544	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1772	260	156	0	0	3648	$0	$0	$7,665	$9,303	$832	$429	$0	$0	$18,200
SUBTOTAL	0	0	1630	3430	950	3680	0	0	9690	$0	$0	$8,558	$18,008	$3,040	$10,120	$0	$0	$39,700
TOTAL	0	0	2160	3730	1500	7710	0	0	15100	$0	$0	$16,243	$22,208	$9,915	$60,495	$0	$0	$108,800
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 8.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

TABLE 24
PROJECT VESSEL TRIPS WITH 8.0 FOOT AT MLW
WITH PROJECT FUTURE CONDITION IN 20-50

LOCATION AND CATEGORY OF VESSEL	TRIPS BY DRAFT									ANNUAL VARIABLE OPERATING COSTS BY DRAFT								
	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL	8.0'+	7.0'	6.0'	5.0'	4.0'	3.0'	2.0'	1.0'-	TOTAL
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 8.0 FOOT MLW																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	710	400	730	5410	0	0	7250	$0	$0	$10,295	$5,600	$9,125	$67,625	$0	$0	$92,600
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	710	400	730	5410	0	0	7250	$0	$0	$0	$0	$0	$0	$0	$0	$92,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1070	572	104	0	0	1746	$0	$0	$0	$5,610	$1,030	$286	$0	$0	$7,700
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$564	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1024	260	156	0	0	3700	$0	$0	$7,665	$9,576	$832	$429	$0	$0	$18,500
SUBTOTAL	0	0	1630	3534	1002	3680	0	0	9846	$0	$0	$8,558	$18,554	$3,206	$10,120	$0	$0	$40,400
TOTAL	0	0	2340	3934	1732	9090	0	0	17096	$0	$0	$8,558	$18,554	$3,206	$10,120	$0	$0	$133,000
VESSEL FEDERAL CUT USE WITH TIDE: 8.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	710	400	730	5410	0	0	7250	$0	$0	$10,295	$5,600	$9,125	$67,625	$0	$0	$92,600
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	710	400	730	5410	0	0	7250	$0	$0	$10,295	$5,600	$9,125	$67,625	$0	$0	$92,600
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	1070	572	104	0	0	1746	$0	$0	$0	$5,610	$1,030	$286	$0	$0	$7,700
INSIDE DAUPHIN ISLAND BAY	0	0	170	640	170	3420	0	0	4400	$0	$0	$893	$3,360	$564	$9,405	$0	$0	$14,200
WEST OF DAUPHIN ISLAND BAY	0	0	1460	1024	260	156	0	0	3700	$0	$0	$7,665	$9,576	$832	$429	$0	$0	$18,500
SUBTOTAL	0	0	1630	3534	1002	3680	0	0	9846	$0	$0	$8,558	$18,554	$3,206	$10,120	$0	$0	$40,400
TOTAL	0	0	2340	3934	1732	9090	0	0	17096	$0	$0	$18,853	$24,154	$12,331	$77,745	$0	$0	$133,000
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 8.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)																		
RECREATIONAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY																		
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
COMMERCIAL																		
SOUTH AND EAST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
INSIDE DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
WEST OF DAUPHIN ISLAND BAY	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SUBTOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TOTAL	0	0	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

TABLE 25: SUMMARY
GOVERNMENT CUT TRIPS AND VARIABLE OPERATING COSTS

LOCATION AND CATEGORY OF VESSEL	EXISTING CONDITION TRIPS	EXISTING CONDITION OPER COST	YEAR 1 TRIPS	YEAR 1 OPER COST	YEAR 10 TRIPS	YEAR 10 OPER COSTS	YEAR 20 TRIPS	YEAR 20-50 OPER COST	AVERAGE ANNUAL TRIPS	AVERAGE ANNUAL OPER COST
	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	YR 1-50
CUMULATIVE VESSEL USE OF THE TWO ROUTES: 4.0 FOOT MLW										
RECREATIONAL	3570	$51,100	3760	$53,000	5410	$77,400	7250	$103,700	5417	$77,500
COMMERCIAL	9638	$52,700	9638	$52,700	9690	$52,900	9846	$53,800	9720	$53,100
TOTAL	13208	$103,800	13398	$106,500	15100	$130,300	17096	$157,500	15137	$130,600
VESSEL FEDERAL CUT USE WITH TIDE: 4.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)										
RECREATIONAL	3391	$40,200	3361	$42,300	4837	$60,900	6483	$81,600	4843	$61,000
COMMERCIAL	7122	$26,500	7122	$26,500	7174	$26,600	7296	$27,100	7193	$26,700
TOTAL	10313	$66,700	10483	$68,800	12011	$87,500	13779	$108,700	12036	$87,700
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 4.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)										
RECREATIONAL	379	$10,900	399	$11,500	573	$16,500	767	$22,000	574	$16,500
COMMERCIAL	2516	$26,300	2516	$26,300	2516	$26,300	2550	$26,700	2526	$26,400
TOTAL	2895	$37,200	2915	$37,800	3089	$42,800	3317	$48,700	3100	$42,900
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 5.0 FOOT MLW										
RECREATIONAL	3570	$47,300	3760	$49,800	5410	$71,600	7250	$96,000	5417	$71,700
COMMERCIAL	9638	$42,700	9638	$42,700	9690	$42,900	9846	$43,600	9720	$43,000
TOTAL	13208	$90,000	13398	$92,500	15100	$114,500	17096	$139,600	15137	$114,700
VESSEL FEDERAL CUT USE WITH TIDE: 5.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)										
RECREATIONAL	3455	$44,000	3639	$46,300	5237	$66,600	7018	$89,300	5243	$66,700
COMMERCIAL	9036	$36,400	9036	$36,400	9088	$36,500	9242	$37,300	9117	$36,700
TOTAL	12491	$80,400	12675	$82,700	14325	$103,100	16260	$126,600	14360	$103,400
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 5.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)										
RECREATIONAL	115	$3,300	121	$3,500	173	$5,000	232	$6,700	173	$5,000
COMMERCIAL	602	$6,400	602	$6,400	602	$6,400	604	$6,400	603	$6,400
TOTAL	717	$9,700	723	$9,900	775	$11,400	836	$13,100	776	$11,400

TABLE 25: SUMMARY CONTINUED

LOCATION AND CATEGORY OF VESSEL	EXISTING CONDITION TRIPS	EXISTING CONDITION OPER COST	YEAR 1 TRIPS	YEAR 1 OPER COST	YEAR 10 TRIPS	YEAR 10 OPER COSTS	YEAR 20 TRIPS	YEAR 20-50 OPER COST	AVERAGE ANNUAL TRIPS	AVERAGE ANNUAL OPER COST
	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	YR 1-50
CUMULATIVE VESSEL USE OF THE TWO ROUTES: 6.0 FOOT MLW										
RECREATIONAL	3570	$45,000	3760	$48,200	5410	$69,300	7250	$92,900	5417	$69,400
COMMERCIAL	9630	$39,000	9630	$39,000	9690	$40,000	9846	$40,700	9720	$40,100
TOTAL	13200	$85,600	13390	$88,000	15100	$109,300	17096	$133,600	15137	$109,500
VESSEL FEDERAL CUT USE WITH TIDE: 6.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)										
RECREATIONAL	3561	$45,500	3750	$47,900	5396	$68,900	7231	$92,400	5403	$69,000
COMMERCIAL	9593	$39,400	9593	$39,400	9645	$39,500	9801	$40,200	9674	$39,700
TOTAL	13154	$84,900	13343	$87,300	15041	$108,400	17032	$132,600	15077	$108,700
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 6.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)										
RECREATIONAL	9	$300	10	$300	14	$400	19	$600	14	$400
COMMERCIAL	45	$500	45	$500	45	$500	45	$500	45	$500
TOTAL	54	$800	55	$800	59	$900	64	$1,100	59	$900
POTENTIAL VESSEL USE OF THE FEDERAL CUT WITH ADEQUATE TIDE: 7.0 FOOT MLW										
RECREATIONAL	3570	$45,600	3760	$48,200	5410	$69,100	7250	$92,600	5417	$69,200
COMMERCIAL	9630	$39,600	9630	$39,600	9690	$39,700	9846	$40,400	9720	$39,900
TOTAL	13200	$85,200	13390	$87,700	15100	$108,800	17096	$133,000	15137	$109,100
VESSEL FEDERAL CUT USE WITH TIDE: 7.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)										
RECREATIONAL	3570	$45,600	3760	$48,100	5410	$69,100	7250	$92,600	5417	$69,200
COMMERCIAL	9630	$39,600	9630	$39,600	9690	$39,700	9846	$40,400	9720	$39,900
TOTAL	13200	$85,200	13390	$87,700	15100	$108,800	17096	$133,000	15137	$109,100
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 7.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)										
RECREATIONAL	0	$0	0	$0	0	$0	0	$0	0	$0
COMMERCIAL	0	$0	0	$0	0	$0	0	$0	0	$0
TOTAL	0	$0	0	$0	0	$0	0	$0	0	$0

TABLE 25: SUMMARY CONTINUED

LOCATION AND CATEGORY OF VESSEL	EXISTING CONDITION TRIPS	EXISTING CONDITION OPER COST	YEAR 1 TRIPS	YEAR 1 OPER COST	YEAR 10 TRIPS	YEAR 10 OPER COSTS	YEAR 20 TRIPS	YEAR 20-50 OPER COST	AVERAGE ANNUAL TRIPS	AVERAGE ANNUAL OPER COST
	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	YR 1-50
CUMULATIVE VESSEL USE OF THE TWO ROUTES: 8.0 FOOT MLW										
RECREATIONAL	3570	$45,600	3760	$48,100	5410	$69,100	7250	$92,600	5417	$69,200
COMMERCIAL	9638	$39,600	9638	$39,600	9690	$39,700	9846	$40,400	9720	$39,900
TOTAL	13208	$85,200	13398	$87,700	15100	$108,800	17096	$133,000	15137	$109,100
VESSEL FEDERAL CUT USE WITH TIDE: 8.0 FOOT MLW: 30 MINUTES TRAVEL (5 MILES)										
RECREATIONAL	3570	$45,600	3760	$48,100	5410	$69,100	7250	$92,600	5417	$69,200
COMMERCIAL	9638	$39,600	9638	$39,600	9690	$39,700	9846	$40,400	9720	$39,900
TOTAL	13208	$85,200	13398	$87,700	15100	$108,800	17096	$133,000	15137	$109,100
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 8.0 FOOT MLW: 60 MINUTES TRAVEL (10 MILES)										
RECREATIONAL	0	$0	0	$0	0	$0	0	$0	0	$0
COMMERCIAL	0	$0	0	$0	0	$0	0	$0	0	$0
TOTAL	0	$0	0	$0	0	$0	0	$0	0	$0

TABLE 26 1/
BENEFITS TO ALTERNATIVES

LOCATION AND CATEGORY OF VESSEL	AVERAGE ANNUAL VARIABLE OPERATING COST					AVERAGE ANNUAL VARIABLE OPERATING COST REDUCTIONS			
	EXISTING CHANNEL 4.0'	5.0'	6.0'	7.0'	8.0'	5.0'	6.0'	7.0'	8.0'
CUMULATIVE VESSEL USE OF THE TWO ROUTES									
RECREATIONAL	$77,500	$71,700	$69,400	$69,200	$69,200	$5,800	$8,100	$8,300	$8,300
COMMERCIAL	$53,100	$43,000	$40,200	$39,900	$39,900	$10,000	$12,900	$13,200	$13,200
TOTAL	$130,600	$114,700	$109,500	$109,100	$109,100	$15,800	$21,000	$21,500	$21,500
VESSEL FEDERAL CUT USE WITH TIDE: 30 MINUTES TRAVEL (5 MILES)									
RECREATIONAL	$61,000	$66,700	$69,000	$69,200	$69,200	($5,700)	($8,000)	($8,200)	($8,200)
COMMERCIAL	$26,700	$36,700	$39,700	$39,900	$39,900	($10,000)	($13,000)	($13,200)	($13,200)
TOTAL	$87,700	$103,400	$108,700	$109,100	$109,100	($15,700)	($21,000)	($21,400)	($21,400)
REROUTED VESSEL FEDERAL CUT USE WITH TIDE: 60 MINUTES TRAVEL (10 MILES)									
RECREATIONAL	$16,500	$5,000	$400	$0	$0	$11,500	$16,100	$16,500	$16,500
COMMERCIAL	$26,400	$6,400	$500	$0	$0	$20,000	$25,900	$26,400	$26,400
TOTAL	$42,900	$11,400	$900	$0	$0	$31,500	$42,000	$42,900	$42,900

1/ DATA IS ROUNDED TO $100.

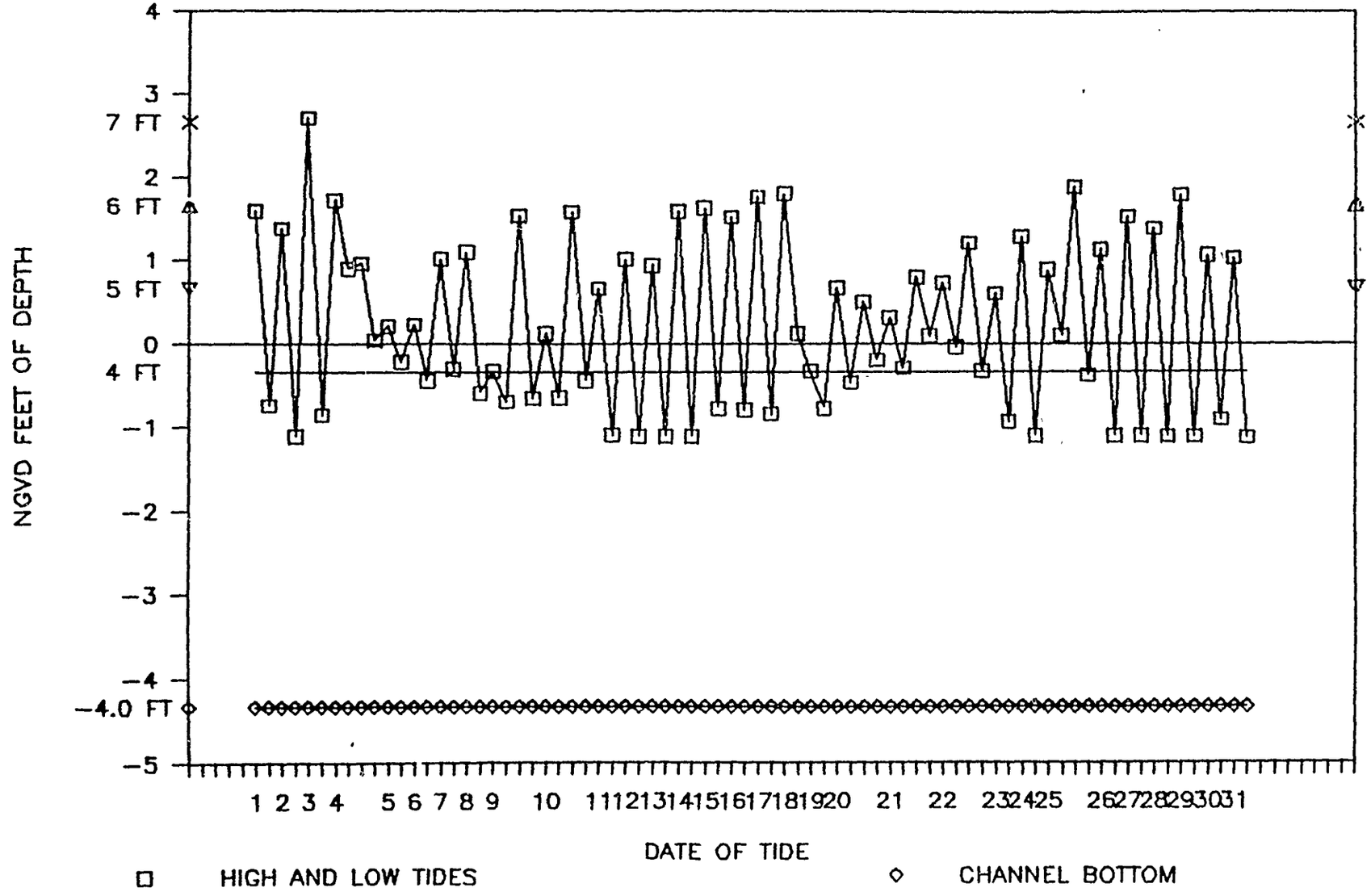
TABLE 27

GOVERNMENT CUT CHANNEL

STRUCTURAL ALTERNATIVE	AVERAGE ANNUAL BENEFITS	AVERAGE ANNUAL COSTS	NET BENEFITS	BENEFIT TO COST RATIO
ALTERNATIVE 1: 5.0' CHANNEL	$15,300	$17,300	($2,000)	0.88
ALTERNATIVE 2: 6.0' CHANNEL	$20,000	$19,000	$1,000	1.05
ALTERNATIVE 3: 7.0' CHANNEL	$20,400	$20,300	$ 100	1.00
ALTERNATIVE 4: 8.0' CHANNEL	$20,400	$21,200	($ 800)	0.96

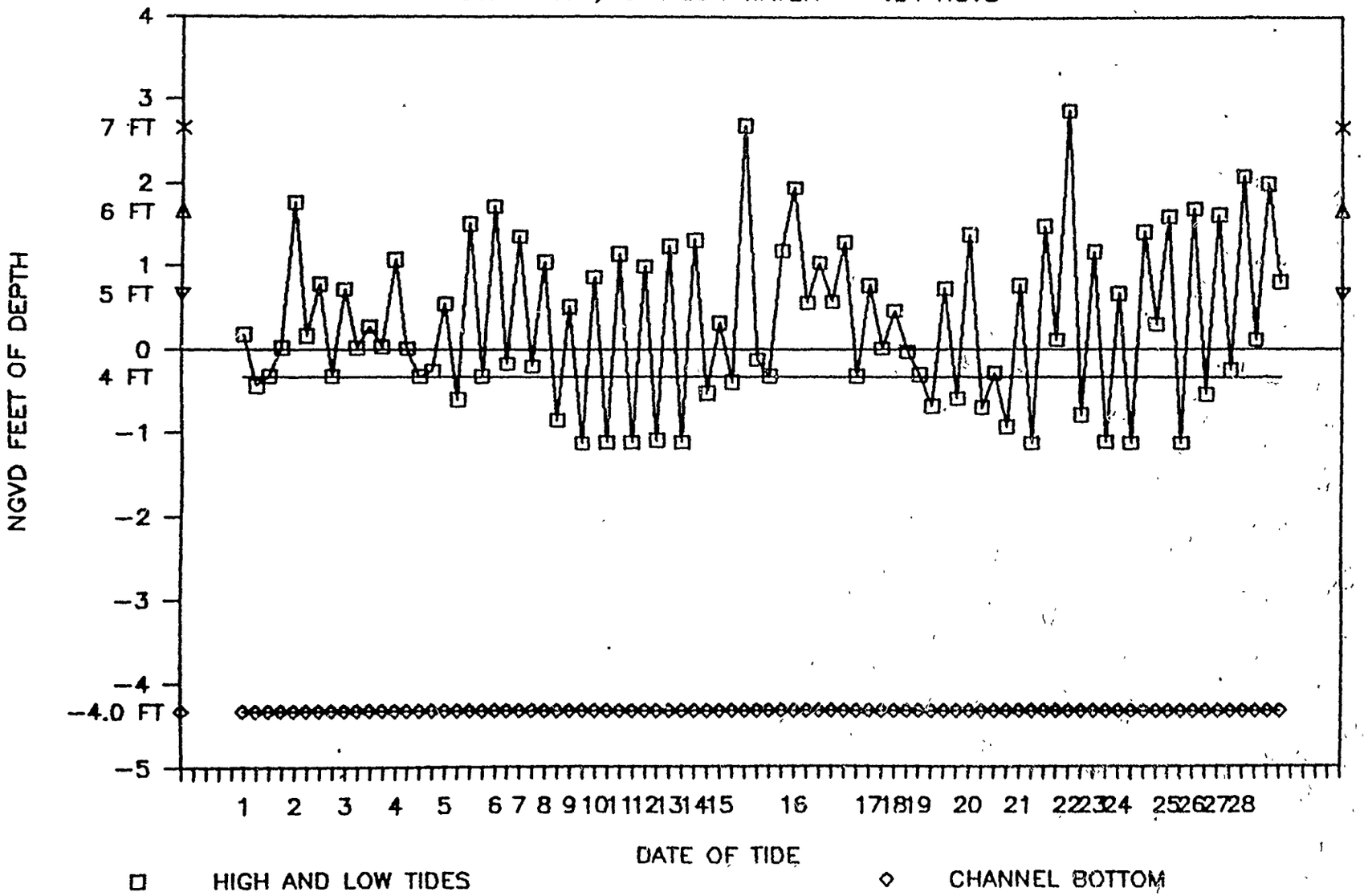
FEDERAL CUT TIDES: JAN. 1987

NGVD = 0.0';MEAN LOW WATER = -.34 NGVD



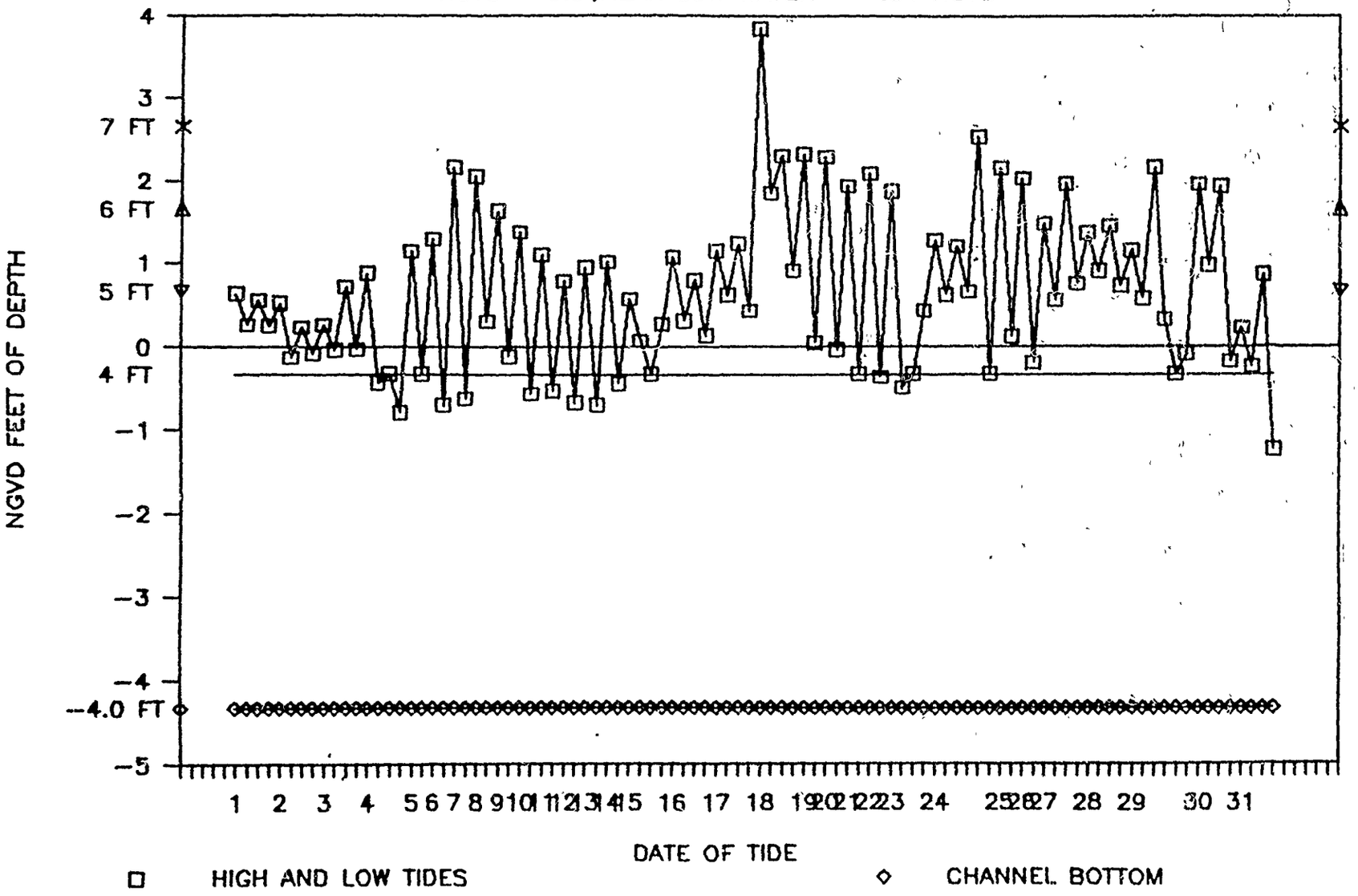
FEDERAL CUT TIDES: FEB. 1987

NGVD = 0.0';MEAN LOW WATER = −.34 NGVD



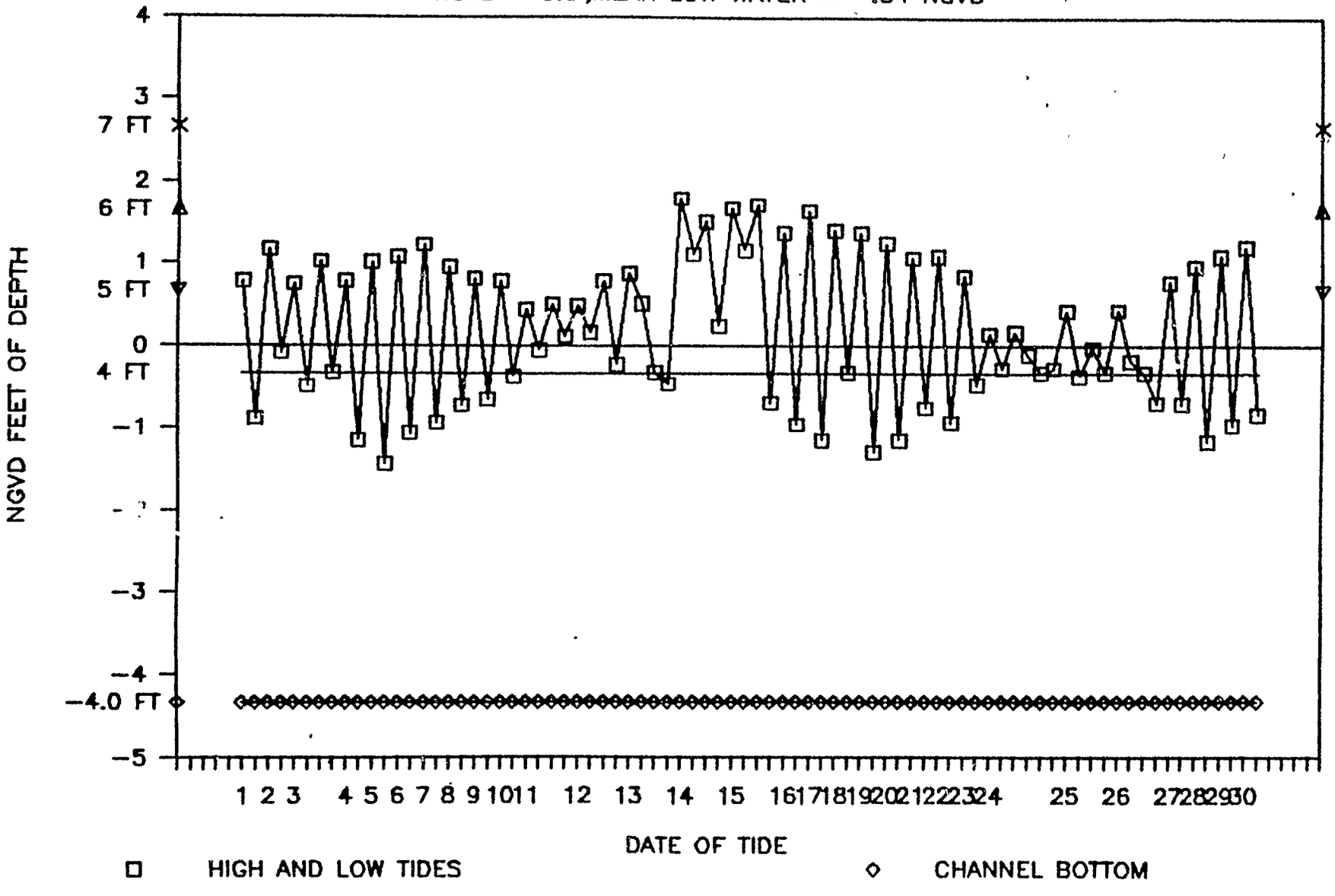
FEDERAL CUT TIDES: MAR. 1987

NGVD = 0.0';MEAN LOW WATER = −.34 NGVD



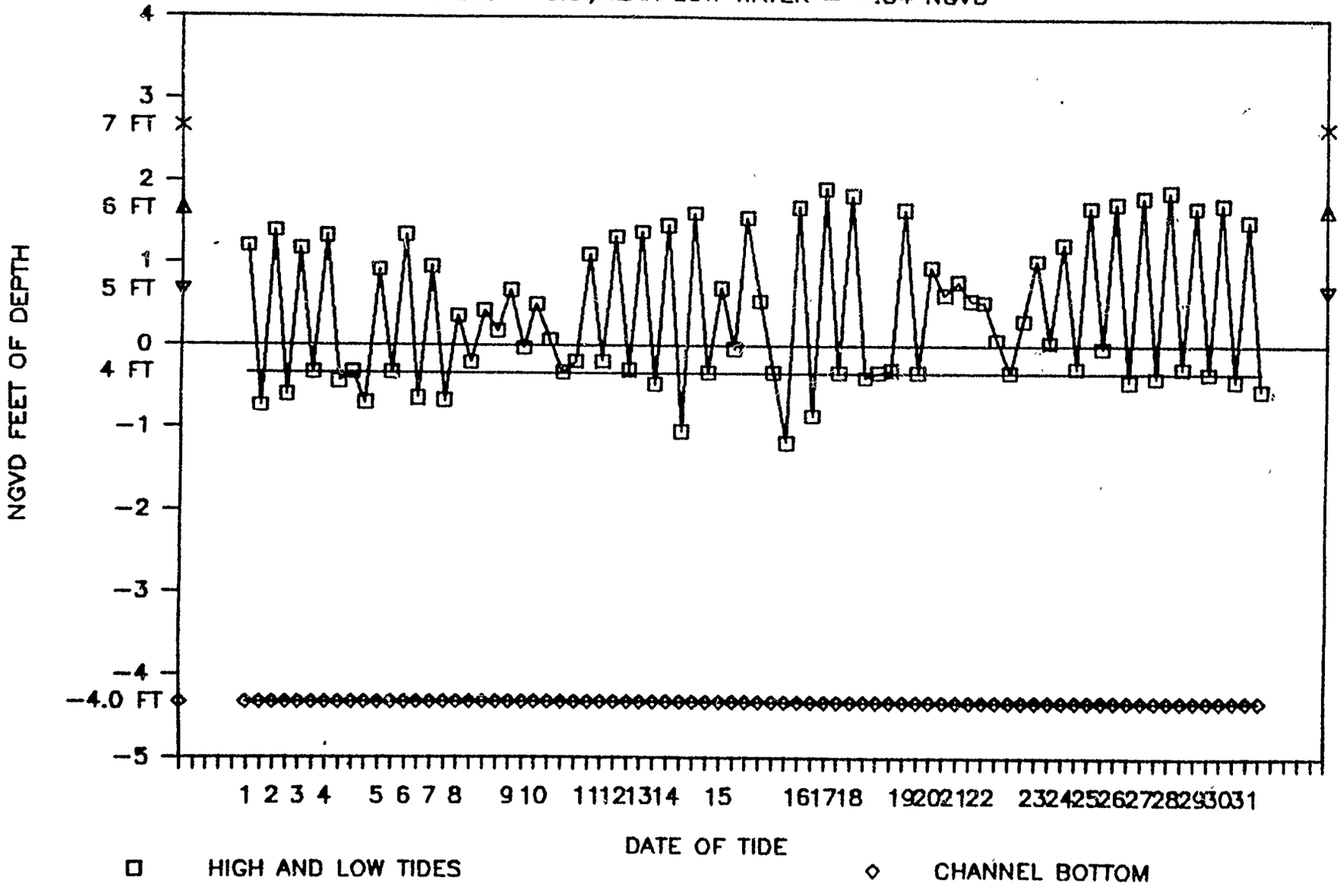
FEDERAL CUT TIDES: APR. 1987

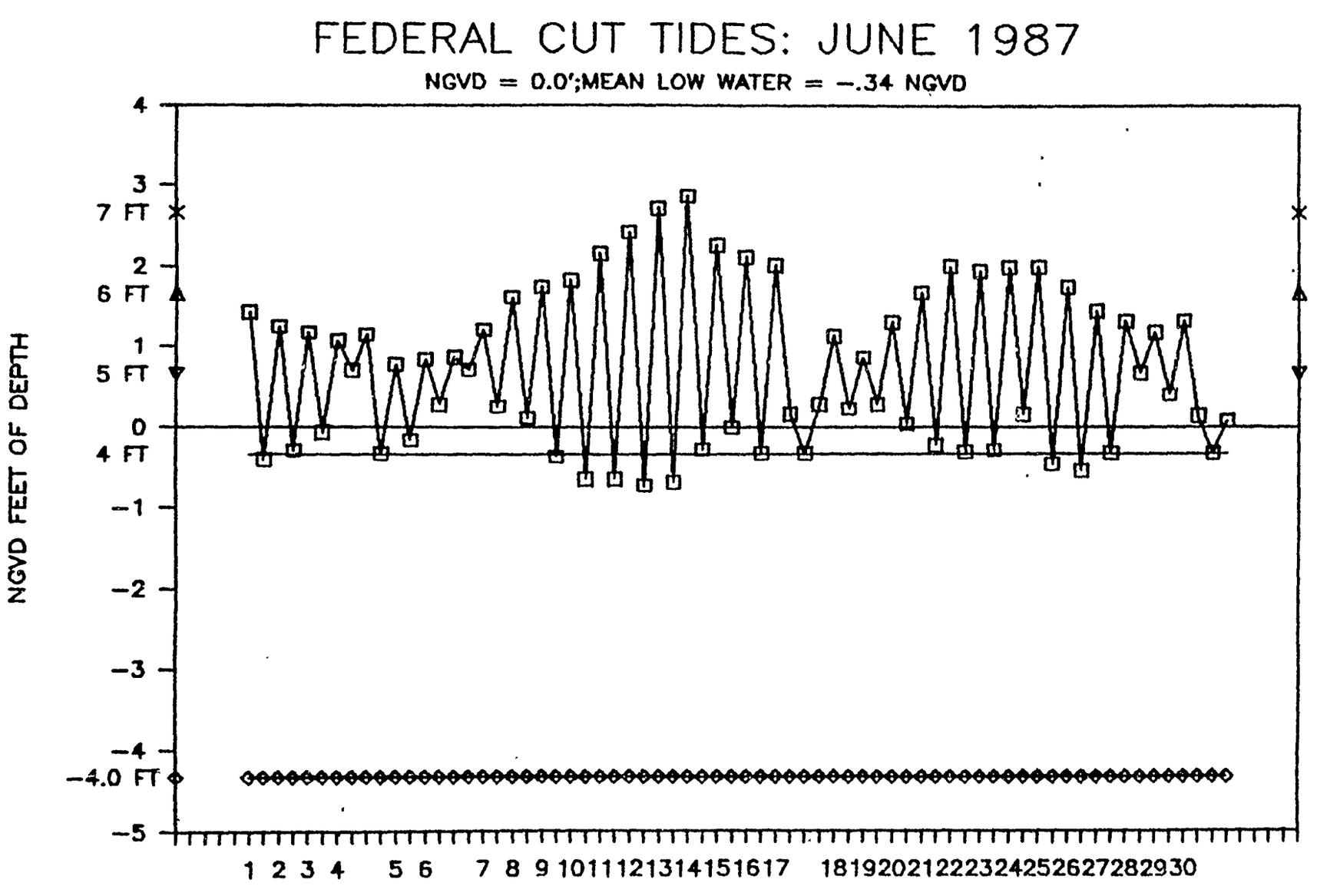
NGVD = 0.0';MEAN LOW WATER = −.34 NGVD

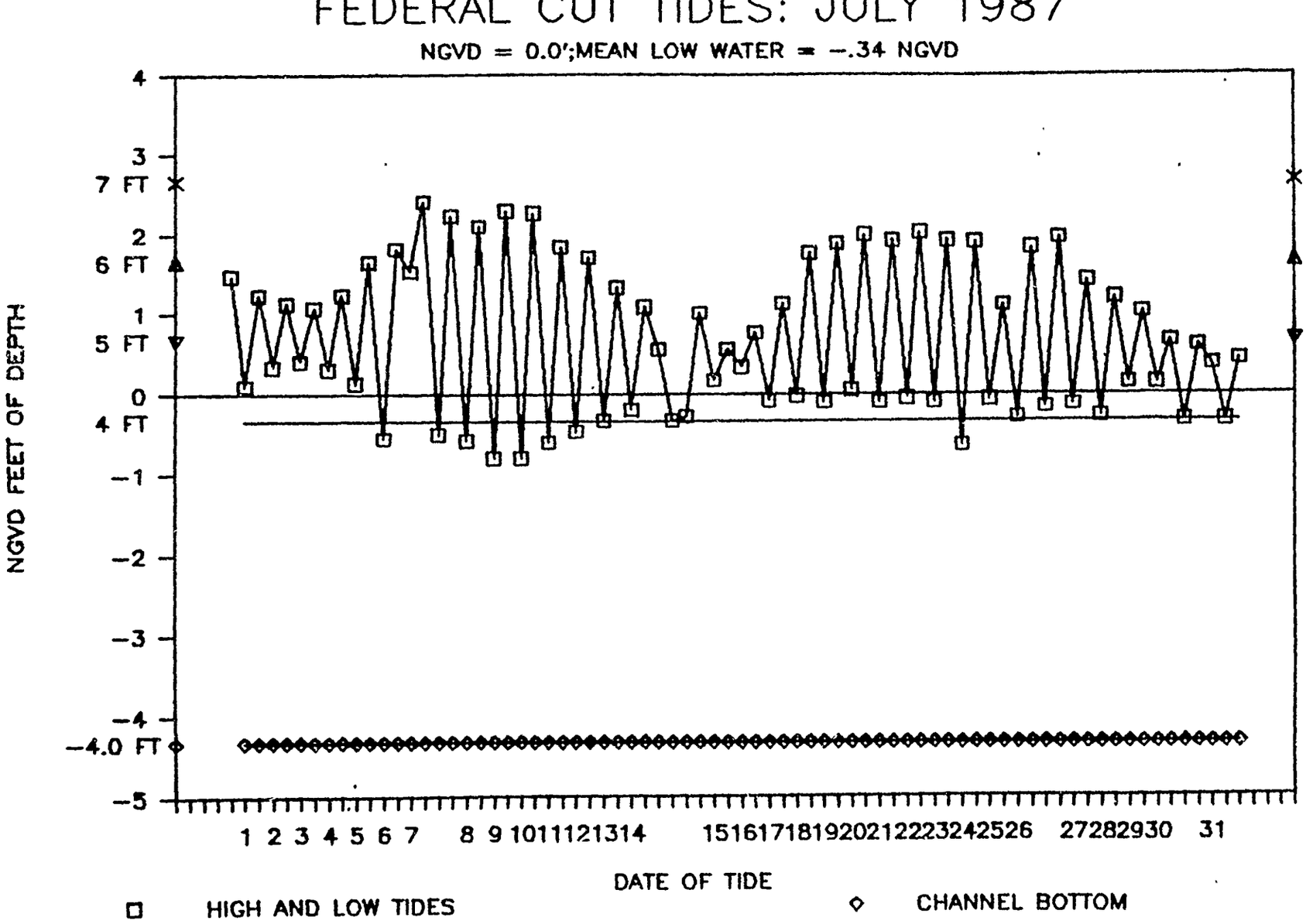


FEDERAL CUT TIDES: MAY 1987

NGVD = 0.0';MEAN LOW WATER = −.34 NGVD

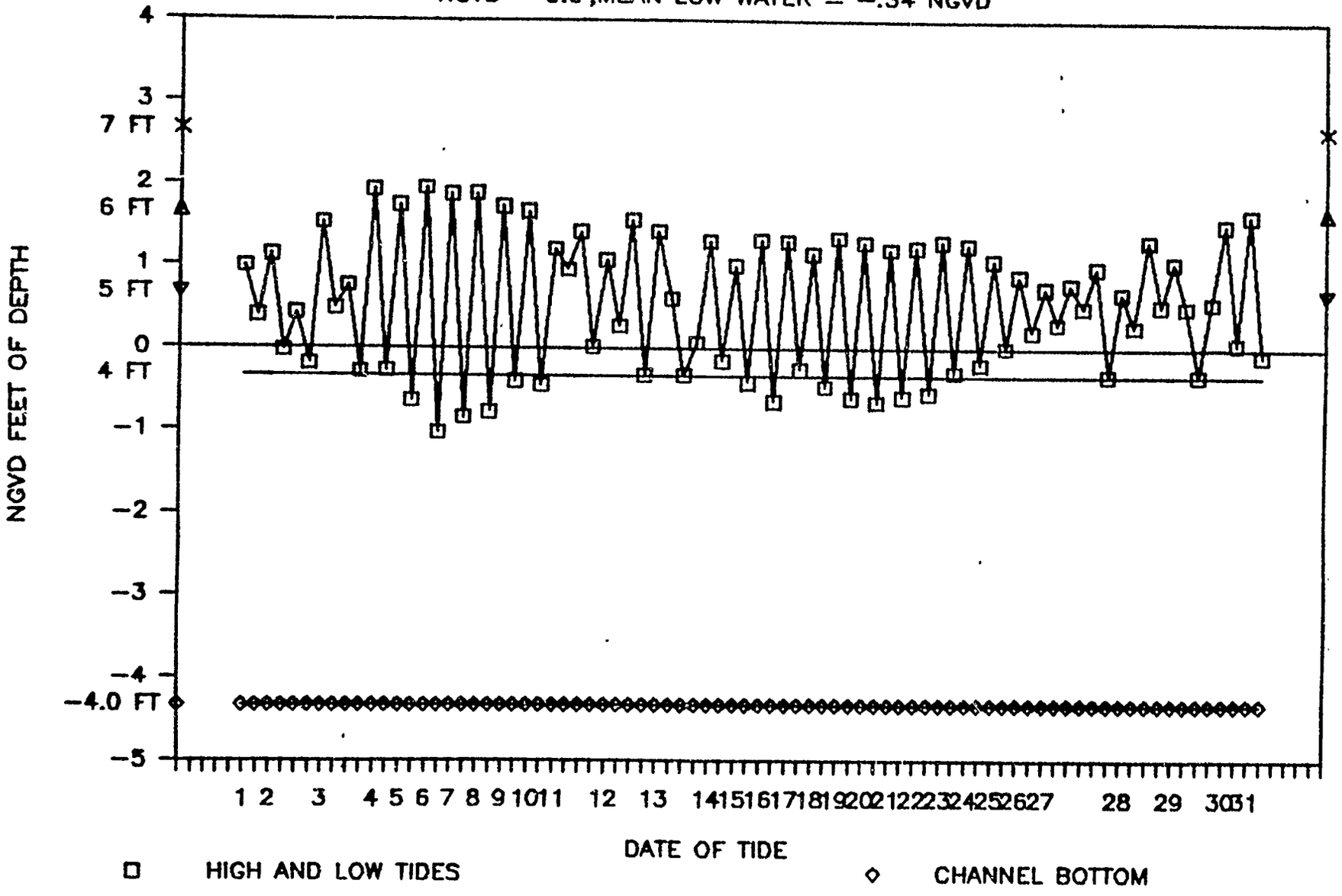



FEDERAL CUT TIDES: JUNE 1987
NGVD = 0.0';MEAN LOW WATER = −.34 NGVD
NGVD FEET OF DEPTH
4
3
7 FT
2
6 FT
1
5 FT
0
4 FT
−1
−2
−3
−4
−4.0 FT
−5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
DATE OF TIDE
HIGH AND LOW TIDES
CHANNEL BOTTOM


FEDERAL CUT TIDES: JULY 1987
NGVD = 0.0';MEAN LOW WATER = −.34 NGVD
NGVD FEET OF DEPTH
4
3
7 FT
2
6 FT
1
5 FT
0
4 FT
−1
−2
−3
−4
−4.0 FT
−5
1 2 3 4 5 6 7 8 9 1011121314 151617181920212223242526 27282930 31
DATE OF TIDE
HIGH AND LOW TIDES
CHANNEL BOTTOM

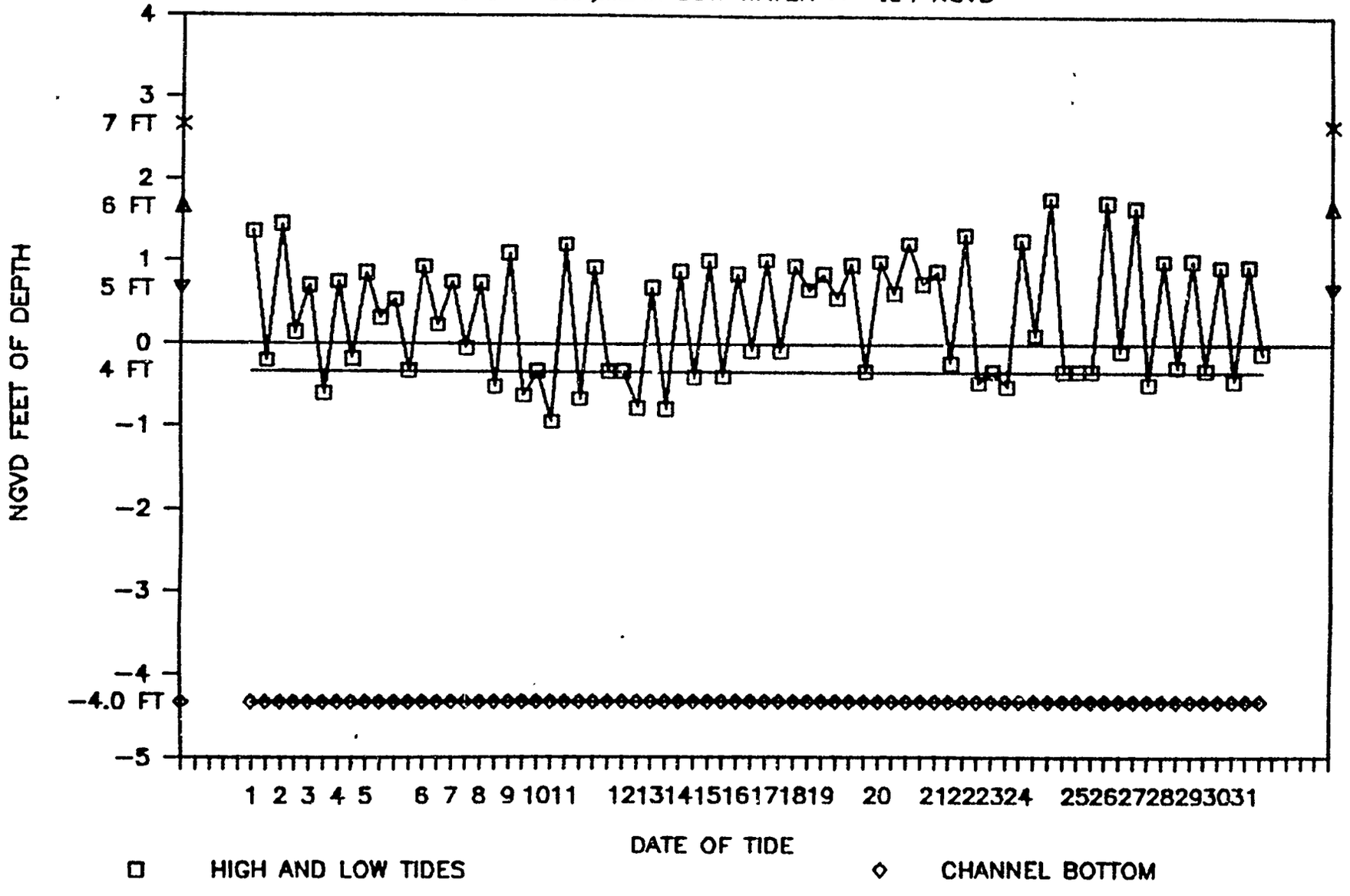
FEDERAL CUT TIDES: AUG. 1987

NGVD = 0.0';MEAN LOW WATER = −.34 NGVD



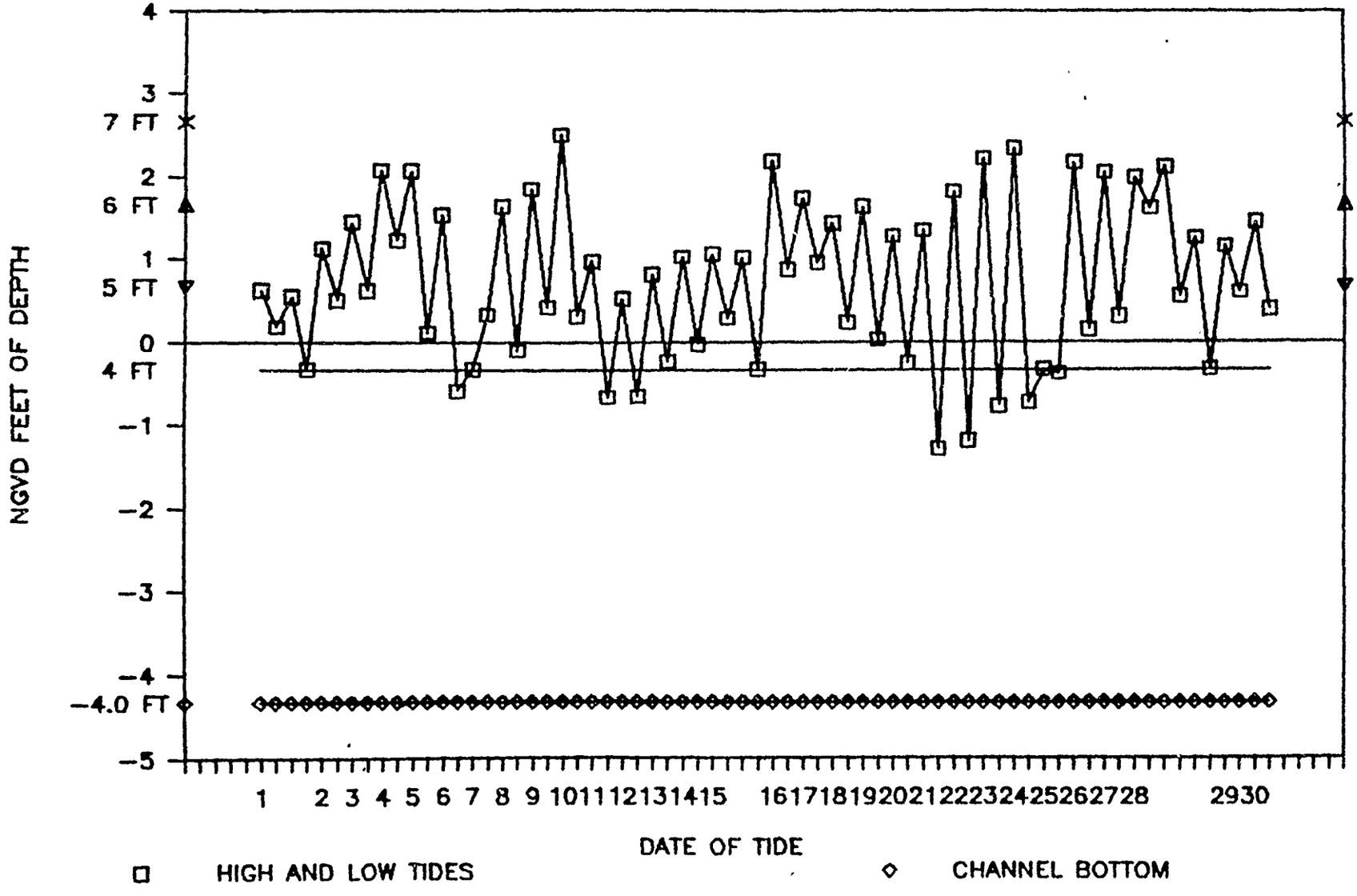
FEDERAL CUT TIDES: OCT. 1987

NGVD = 0.0';MEAN LOW WATER = −.34 NGVD



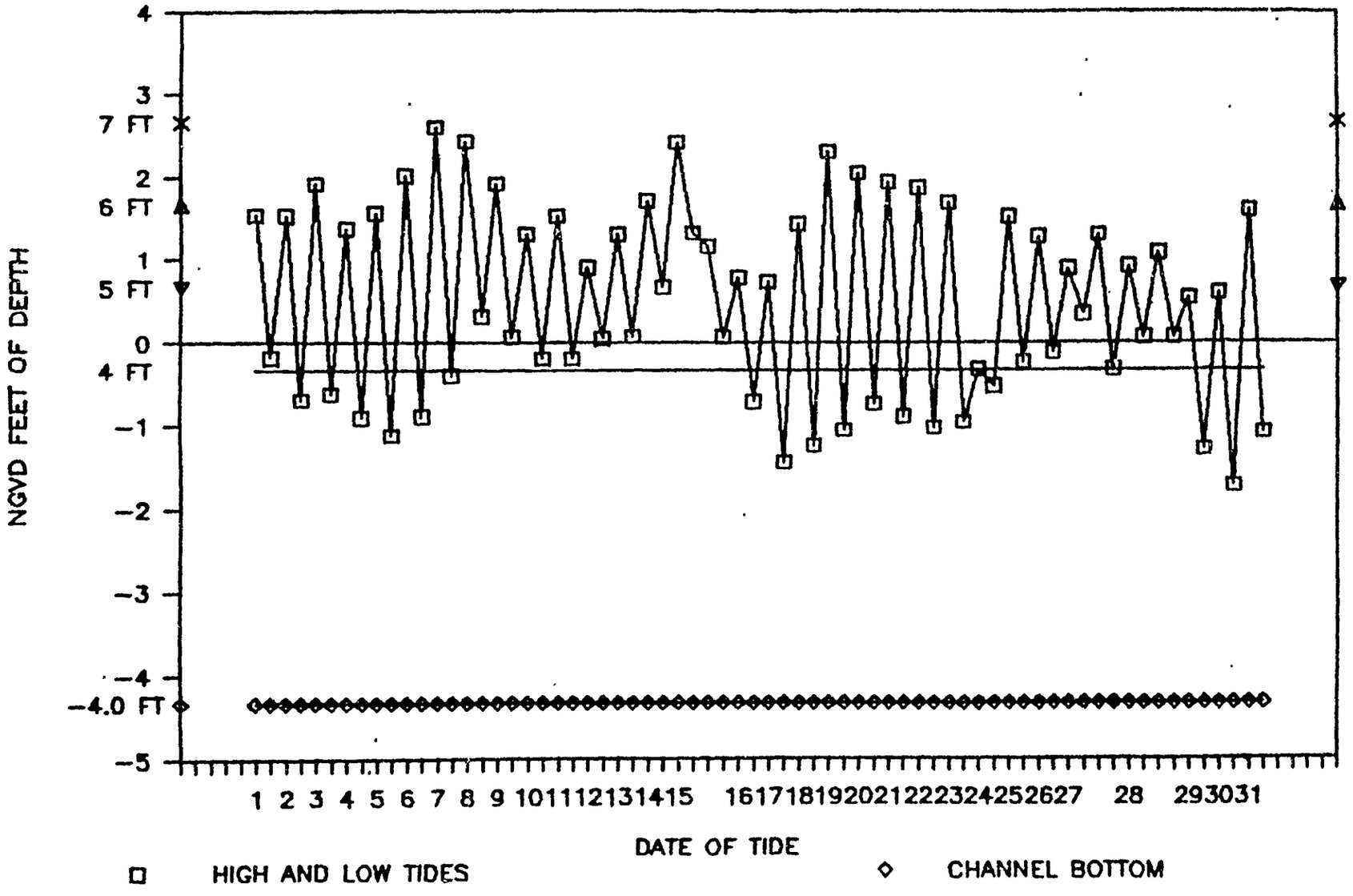
FEDERAL CUT TIDES: NOV. 1987

NGVD = 0.0';MEAN LOW WATER = −.34 NGVD



FEDERAL CUT TIDES: DEC. 1987

NGVD = 0.0';MEAN LOW WATER = −.34 NGVD



APPENDIX B

APPENDIX B

PUBLIC INVOLVEMENT AND COORDINATION

TABLE OF CONTENTS

SECTION I

LOCAL COOPERATION

R E S O L U T I O N

WHEREAS, the Mobile County Commission has an interest in waterways around Dauphin Island for their use by the commercial and residential boaters of this County; and

WHEREAS, the Corps of Engineers has the authority under Section 1070 of the River and Harbor Act of 1960 to study improvements to these waters;

NOW THEREFORE, BE IT RESOLVED, that the Mobile County Commission does hereby support a two phase study of the requirement for an additional two (2) feet of depth in the so-called "Government Cut" channel at Dauphin Island;

BE IT FURTHER RESOLVED, that the County Commission hereby appoints the County Engineer as its representative to work with the Corps of Engineers in all phases of this study.

ADOPTED this 25 day of January, 1988.

W. C. HELVESTON, ADMINISTRATOR

MOBILE COUNTY COMMISSION
POST OFFICE BOX 1443 MOBILE, ALABAMA 36633
TELEPHONE (205) 690-8605 FAX (205) 690-4770

October 25, 1989

Mr. M. C. McClure IV
Chief, Planning Division
Mobile District Corps of Engineers
P. O. Box 2288
Mobile, AL 36628-0001

Re: Coastal Section

Dear Sir:

Please be advised that the Mobile County Commission is willing to act as the non-Federal sponsor for the proposed modifications of the Ft. Gaines Channel, Dauphin Island, AL. While we understand that there is no financial obligation on our part at this time, but that financial obligations will be created upon the signing of the Local Cooperation Agreement, we have budgeted in our FY 89-90 Capital Improvement Program, $29,000 dedicated to this project.

Please advise should additional information be necessary.

Yours very truly,

MOBILE COUNTY COMMISSION

JAMES L. MASON, PRESIDENT

SAMUEL L. JONES, COMMISSIONER

WILLIAM J. MENTON, COMMISSIONER

/egw

Copy: Joe W. Ruffer, County Engineer

SECTION 2
PUBLIC PARTICIPATION

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, ALABAMA 36628-0001

November 28, 1988

REPLY TO
ATTENTION OF:
Western Basins Section

THIS IS YOUR INVITATION

This is to announce a public workshop to discuss the current and future navigation studies for deepening the Fort Gaines Channel commonly called "Government Cut Channel". The workshop will be held:

Wednesday, December 7, 1988

7:00 - 9:00 P.M.

Dauphin Island Civic Center

Dauphin Island, Alabama

WE WILL DISCUSS

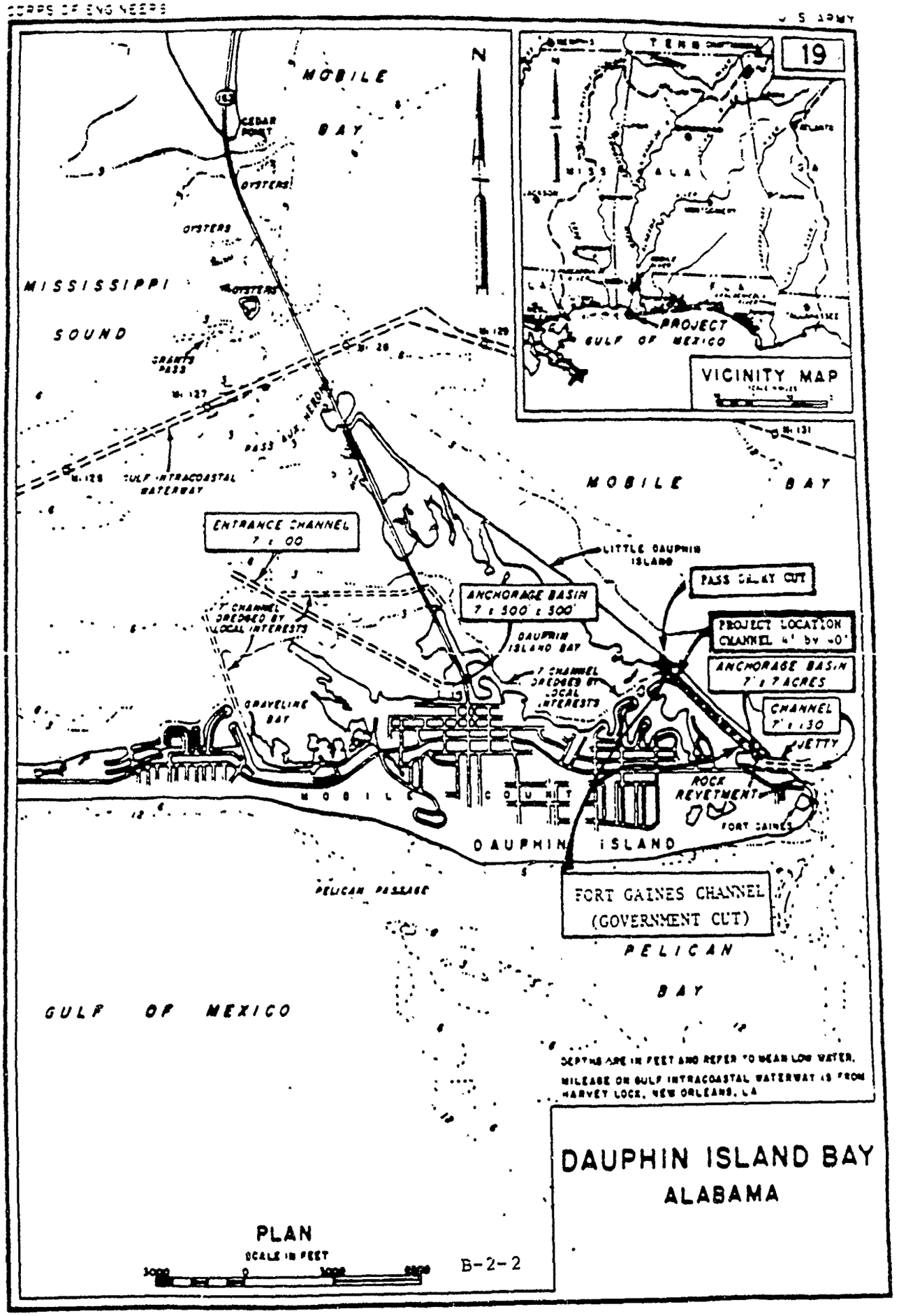
- o The Water Resources Development Act of 1986.
- o Study History and Continuing Authority.
- o Navigation Problem.
- o Scope of Study
  - Economic/Environmental Assessment Engineering
  - Local Cooperation Agreement
  - Project Cost Sharing

WE WANT YOUR HELP

We have initiated a reconnaissance phase study for modification of the Federal project and we need your participation at the meeting to provide data on the problem, alternative you prefer, and cooperation while we work in your area. We hope to clarify the planning process for this type of project, and respond to any questions you may have.

We ask that you attend and advise your neighbor of this meeting. If you cannot attend and feel that your information or views need to be brought to our attention, send written material to Mr. Joe Ruffer, Mobile County Engineer at Post Office Box 1443, Mobile, Alabama 36633, or to us as follows: U.S. Army Corps of Engineers, ATTN: CESAM-PD-FW, P.O. Box 2288, Mobile, AL 36628-0001. The study manager is Mr. Charles Owens and he can be reached at (205) 694-3874.

N.D. McCLURE, IV
Chief,
Planning Division


MOBILE BAY
CEDAR POINT
OYSTERS
MISSISSIPPI SOUND
GRANTS PASS
PASS AUX HERON
GULF INTRACOASTAL WATERWAY
N
19
TENN.
MISS.
ALA.
LA.
FLA.
PROJECT
GULF OF MEXICO
VICINITY MAP
MOBILE BAY
ENTRANCE CHANNEL
7' x 00
LITTLE DAUPHIN ISLAND
PASS DELAY CUT
ANCHORAGE BASIN
7' x 300' x 300'
7' CHANNEL DREDGED BY LOCAL INTERESTS
DAUPHIN ISLAND BAY
PROJECT LOCATION
CHANNEL 4' by 40'
ANCHORAGE BASIN
7' x 7 ACRES
CHANNEL
7' x 30'
JETTY
GRAVELINE BAY
ROCK REVETMENT
FORT GAINES
MOBILE COUNTY
DAUPHIN ISLAND
PELICAN PASSAGE
FORT GAINES CHANNEL
(GOVERNMENT CUT)
PELICAN BAY
GULF OF MEXICO
DEPTHS ARE IN FEET AND REFER TO MEAN LOW WATER.
MILEAGE ON GULF INTRACOASTAL WATERWAY IS FROM HARVEY LOCK, NEW ORLEANS, LA
DAUPHIN ISLAND BAY
ALABAMA
PLAN
SCALE IN FEET
B-2-2

PUBLIC INFORMATION FACT SHEET

SUMMARY OF DECEMBER 7, 1988 PUBLIC WORKSHOP

Fort Gaines Channel
DAUPHIN ISLAND, ALABAMA

US Army Corps
of Engineers
Mobile District

JANUARY 1989

DEPARTMENT OF THE ARMY
U S ARMY ENGINEER DISTRICT MOBILE
P O BOX 2288
MOBILE, ALABAMA 36628-0001

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

CESAM-PD-FW
(Ft.Gaines)

PUBLIC PARTICIPATION INFORMATION FACT SHEET

PURPOSE OF THE FACT SHEET

The studies of the Fort Gaines channel at Dauphin Island are being conducted under authority provided in Section 107 of the River and Harbor Act of 1960, as amended. The Mobile District, Corps of Engineers, conducted a public workshop at Dauphin Island Civic Center on Dauphin Island, Alabama, on December 7, 1988, to discuss that study. In the announcement of the workshop, participants were provided a list of items to be discussed. Approximately 50 people attended the workshop. There was active participation by those in attendance during the question and answer period, which resulted in a better understanding of the concerns and desires of the area residents, special interests, and property owners of the area.

This fact sheet has been prepared to record what we heard at the workshop and what we said. It provides a summary of comments and questions and the responses we gave. It also gives some information on the reporting schedule.

SUMMARY OF DISCUSSIONS

The following is a summary of the comments and questions that were expressed and the responses as provided by letter and at the workshop:

o Is project cost sharing still in effect?

- Yes, the Water Resources Development Act of 1986 requires that for general navigation projects, a non-Federal sponsor make a cash contribution of 10 percent of the project cost during the construction period in addition to having provided all lands, easement, rights-of-way relocations and dikes for disposal areas (LERRD). The sponsor is also required to provide another 10 percent of the general navigation features of the project in cash over a period not to exceed 30 years. The value of LERRD can be credited toward the 30-year cash payment.

o What do you mean when you say 10 percent cash contribution be provided by a non-Federal sponsor?

- In the past the Corps has constructed general navigation projects at Federal expense after the local sponsor furnished the lands and certain other works, but now a cash contribution of 10 percent of the first cost of construction is required for channels in the Fort Gaines depth range. This cost must be provided during project construction. The additional 10 percent cash payment over 30 years would be less the value of LERRD.

o How long will it take to do the reconnaissance phase study?

- It will take approximately 12 months from study initiation which started in September 1988 to completion for the reconnaissance phase. If further studies are indicated, which will take about another 18 months, the non-Federal sponsor will be required to provide 50 percent of those additional study costs. That phase of the study, if favorable, would result in a Definite Project Report.

o What is the cost for deepening the channel?

- Our very preliminary investigations indicate the cost for deepening the channel would be about $62,000. That cost is subject to change when detailed studies are made.

o After the project is completed who will maintain it?

- The Federal government will be responsible for construction and maintenance of the project.

o The deepening of Fort Gaines channel (Government Cut) does not remove the shoal that exists just around the northern neck of the channel. When will this shoal be removed?

- The shoal area both within Government Cut and extending around the neck of the channel will be removed and the material will be used to close Pass Drury. This work is anticipated to begin during February 1989.

o What does the City of Dauphin Island need to do to get the channel deepened?

- At this time, there is nothing the city need do. However, as the study nears completion the city may need to get with the Mobile County Commission, now acting as sponsor, and insure that the local requirements are met. These include providing a letter of intent stating their support for modifying the channel. We will need this letter of intent for our final report. Also, a draft Local Corporation Agreement between the Federal Government and the non-Federal sponsor must be coordinated and provided with the report.

o When do we sign the Local Corperation Agreement?

- The Local Cooperation Agreement must be signed when the project document is approved and immediately prior to project construction.

o Who is responsible for maintaining the 7-foot Dauphin Island Bay channel?

- The State of Alabama, represented by Mr. Hugh Swingle, the Director of Marine Resources Division of the Alabama Department of Conservation, is responsible and has been maintaining the channel at 6 feet.

o If the Government Cut is deepened, who will be responsible for maintaining it since the Corps does not keep the existing channel maintained?

- The last maintenance dredging contract on the Government Cut was September 1987. Due to the open Pass Drury, depths were not maintained very long. This should be improved with the closure of Pass Drury. When the channel is deepened the Corps will still be responsible for maintaining the project.

o Who is responsible for maintaining the Aloe Bay (Village Channel) and when was it last dredged?

- The Corps of Engineers is responsible for maintaining the channel. The channel is dredged as needed or upon request. The last time it was maintenance dredged was January 1977. This is due largely because the dredged material cannot be disposed in open waters because of environmental restrictions. Further, a local sponsor has not been identified to provide suitable disposal areas for the project and therefore has not been dredged recently.

o When will Pass Drury be closed?

- The advertisement date for the proposed closure work was December 6, 1988, and the bid opening date is set for January 19, 1989. Work is anticipated to begin during February 1989. Work should take approximately 1 month to complete the closure.

o Will the closure of Pass Drury protect the Dauphin Island Bay area from hurricane surge?

- No, it would delay the onset of the surge, but the maximum height would be the same. The water would come around from the north side of the island.

o How will the Pass be closed?

- The Pass will be closed with the material dredged from the Dauphin Island Bay end of Government Cut.

o Why doesn't the Corps riprap Pass Drury instead of closing it with the dredged material (sand) which is subject to blowout again?

- We considered doing some structural modification in the Pass to prevent shoaling in the channel. However, that property belongs to the Department of the Interior as part of the Bon Secour National Wildlife Refuge. We consulted with them and was informed that a structural modification would not be acceptable under the Coastal Barrier Resources Act of 1982. The decision was made by the Department of the Interior to restrict any structural measures other than filling the shoreline to preexisting conditions.

o Can land owners put a slip to their private lot off the Government Cut?

- Yes, this would require a permit action. Criteria for a slip to private property are: it must be less than 50-feet landward, it must have less than 300 cubic yards of dredged material, and it cannot exceed the depth of the existing channel. For more information on permits or State application fees contact Mr. Davis Findley of our Permit Section at 205/690-2581, or Mr. Brad Gane of the Alabama Department of Environmental Management at 205/479-2336 respectively. Further, if the slip require an environmental impact determination the Corps can make the determination at the landowner's expense.

FUTURE ACTIONS

As you know, we have initiated the Reconnaissance phase study on improving the Fort Gaines channel. We need your cooperation while we work in your area. The reconnaissance phase study is scheduled to be completed in September 1989. At that time, the local sponsors financial capability will be assessed and they will be required to provide one half of any additional study costs if further study is indicated.

Thank you for your participation in the workshop. A special thanks also to the Mayor and City Council, and the Property Owners Association for hosting the workshop. If you have any further questions concerning this study, you may call the Study Manager at (205) 694-3874 or write to the address shown below.

Charles Owens
U.S. Army Corps Of Engineers, Mobile
ATTN: CESAM-PD-FC
Post Office Box 2288
Mobile, Alabama 36628-0001

SECTION 3
COORDINATION LIST

Regional Office
U.S. Forest Service
Department of Agriculture
1720 Peachtree Road, Suite 720
Atlanta, GA 30309

Director
Office of Ecology and Conservation
National Oceanic and Atmospheric Admin.
Department of Commerce 4
Room 5813 (PP/EC) 4
14th and Constitution Ave., N.W.
Washington, DC 20230

New Orleans Area Weather
Service Forecast Office
120 Old Spanish Trail
Slidell, LA 70458

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Division of NEPA Affairs 10
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Room 4G085
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Washington, DC 20585

Department of Health & Human Service
200 Independence Ave., S.W. 2
Washington, DC 20201

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Atlanta, GA 30323

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Atlanta, GA 30303

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Endangered Species Field Office
U.S. Fish and Wildlife Service
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Jackson, MS 39213

Mr. Larry Goldman
Field Supervisor
U.S. Fish & Wildlife Service
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New Orleans, LA 70130

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Southern Region
Federal Aviation Administration 2
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Federal Railroad Administration
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East Point, GA 30044

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Department of Transportation 2
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Washington, DC 20460

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Ecological Review Office
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Atlanta, GA 30365

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Environmental Review Section
Environmental Protection Agency
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Atlanta, GA 30365

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Environmental Protection Agency 5
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Federal Emergency Management
Agency
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Atlanta, GA 30367

Regional Administrator
Small Business Administration
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Atlanta, GA 30367

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Department of Agriculture
Room 412A, Admin Building
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Washington, DC 20250

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1100 Pennsylvania Ave., N.W.
Washington, DC 20004

Federal Co-Chairman
Appalachian Regional Commission
1666 Connecticut Ave., N.W.
Washington, DC 20235

Environmental Protection Agency
ATTN: Mr. Gerald Miller
EIS Review Section
345 Courtland Street, N.E.
Atlanta, GA 30365

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National Marine Fisheries Service
Southeast Regional Office
3450 Koger Boulevard
St. Petersburg FL 33702

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Dauphin Island AL 36528

Honorable Richard Shelby
United States Senate
Washington, DC 20510

Honorable Howell Heflin
United States Senate
Washington, DC 20510

U.S. Forest Service
Department of Agriculture
1765 Highland Avenue
Montgomery, AL 36107

State Conservationist
Soil Conservation Service
Department of Agriculture
Post Office Box 311
Auburn, AL 36830

Agricultural Stabilization and
Conservation Service
474 South Court Street
Room 714
Montgomery, AL 36192

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Department of Commerce
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Birmingham, AL 35205

Director
District Office
International Trade Administration
Department of Commerce
908 South 20th St., Suite 200
Birmingham, AL 35205

Economic Development Admin
Department of Commerce
474 South Court Street
Montgomery, AL 36104

National Weather Service
NOAA
11 West Oxmoor Road, Suite 417
Birmingham, AL 35209

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Urban Development
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Birmingham, AL 35233

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U.S. Geological Survey
Department of the Interior
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Tuscaloosa, AL 36104

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Federal Highway Administration
Department of Transportation
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Montgomery, AL 36104

Regional Director
Veterans Administration
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Washington, DC 20515

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Postmaster
Mobile, AL 36601

Honorable Guy Hunt
Governor
State of Alabama
Montgomery, AL 36130

Honorable Jim Folsom
Lieutenant Governor
State of Alabama
Montgomery, AL 36130

Honorable Don Siegleman
Attorney General
State of Alabama
State House
Montgomery, AL 36130

Commissioner
Department of Agriculture
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Post Office Box 3336
Montgomery, AL 36193

Mr. Larry Oaks
Alabama State Historic
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ATTN: Mr. Mack Brooms
Alabama Historical Commission
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Department of Conservation
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Department of Conservation
and Natural Resources
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Chief
Wildlife Management Section
Division of Game and Fish
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Alabama Department of
Environmental Management
1751 Federal Drive
Montgomery, AL 36130

Water Supply Division
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1751 Federal Drive
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Water Quality Division
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Supv., Oil and Gas Board
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Water Resources Division
Geological Survey of Alabama
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Engineering Division
Alabama Public Service Commission
Post Office Box 991
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Soil and Water Conservation
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Montgomery, AL 36193

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Alabama Department of Economic
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Montgomery, AL 36105-0939

Mr. Hugh Swingle, Director
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Department of Conservation and
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Ways and Means Committee
House of Representatives
Alabama State House
Montgomery AL 36130

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Alabama Department of Conservation
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Game and Fish Division
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Spanish Fort, AL 36527

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P.O. Box 610
Dauphin Island AL 36528

Honorable Billy Patronas
Alderman
P.O. Box 610
Dauphin Island AL 36528

Honorable Jim Boone
Alderman
P.O. Box 610
Dauphin Island AL 36528

Honorable Georgia Mallon
Alderman
P.O. Box 610
Dauphin Island AL 36528

Honorable Jeff Collier
Alderman
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Honorable Claude Brown
Alderman
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Dauphin Island AL 36528

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Sewer Authority
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Dauphin Island AL 36528

Hon. William (Bill) Menton
Mobile County Commissioner, Place 3
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Irvington AL 36544

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701 Government Street
Mobile, AL 36602

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County Engineer
P.O. Box 1443
Mobile AL 36633

Azalea City News
P.O. Box 91354
Mobile, AL 36691

The Mobile Press Register, Inc.
304 Government Street
Mobile, AL 36602

WABB AM & FM
1551 Spring Hill Avenue
Mobile, AL 36604

WALA-TV
P.O. Box 1548
Mobile, AL 36633

WKSJ AM & FM
P.O. Box 160706
Mobile, AL 36616

WKRG-TV AM-FM, Inc.
555 Broadcast Drive
Mobile, AL 36606

Alayr's Shoes
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Mobile AL 36616

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BCM Converse, Inc.
P.O. Box 1784
Mobile AL 36633

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Attorneys-at-Lavff, Chief
ATTN: Mr. Warren Hammond
P.O. Box 3045
Mobile AL 36652

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Mobile AL 36608

Mr. Arthur L. Byrne
Dauphin Island Marina
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Mobile AL 36652

Fowl River Marine Service
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Theodore AL 36582

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Joe Geil Plumbing Company
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John E. Graham and Sons
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Bayou La Batre AL 36509

Imperial Shrimp, Inc.
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Bayou La Batre AL 36509

Johnson Shipbuilding and Repair
P.O. Box 592
Bayou La Batre AL 36509

Mr. Alex F. Lankford, III
Hand, Arendall, Bedsole, Greaves
and Johnston
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Mobile AL 36601

Mr. Floyd E. Lanier
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Mr. Thomas B. MacKinnon
MacKinnon Paper Company, Inc.
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Mobile AL 36601-9012

Master Marine, Inc.
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Bayou La Batre AL 36509

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Certified Public Accountants
ATTN: Mr. George Gunn, Jr.
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Mobile AL 36616

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Mobile AL 36606

Rodriguez Boat Builders
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Bayou La Batre AL 36509

Syn-Fab Paper Mill Television Systems
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Mobile AL 36608

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Canoe Club of Birmingham
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Mountain Brook, AL 35243

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the United States
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Washington, DC 20005

The Nature Conservancy
c/o Mr. Rich Fortenberry, Jr.
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Southeast Representative
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Society
c/o Department of Wildlife and
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Mississippi State, MS 39762

Tally Riddel, Jr.
Tupelo Chapter of Ducks
Unlimited
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Tupelo, MS 38801

Environmental Defense Fund
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New York, NY 10010-7304

National Audubon Society
Southeast Regional Office
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Birmingham, AL 35203

Mr. David J. Vann
Carlton, Vann, and Stichweh
Attorneys at Law
303 Frank Nelson Building
Birmingham, AL 35203-2669

Mr. Jerome Carroll, Refuge Mgr
Bon Secour National Wildlife Refuge
P.O. Box 1569
Gulf Shores AL 36542

Admiral Bill Stevart, Pres.
Dauphin Island Property
Owners Association
P.O. Box 366
Dauphin Island AL 36529

Jesse Acree
P.O. Box 1443
Mobile, AL 36607

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SECTION 4
REPORT COORDINATION

United States Department of the Interior

FISH AND WILDLIFE SERVICE

P.O. Drawer 1190
Daphne, Al 36526

January 29, 1990

District Engineer
U.S. Army Corps of Engineers
P.O. Box 2288
Mobile, AL 36628

Dear Sir:

In accordance with the Letter of Agreement between our agencies for Fiscal Year 1989, the Fish and Wildlife Service (Service) has completed this final Fish and Wildlife Coordination Act Report relative to the Navigation Improvements at Government Cut, Dauphin Island, Alabama. The report assesses the effects of the proposed project upon fish and wildlife resources and identifies design modifications to minimize resource losses.

Our report has been prepared under the authority of, and is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 410, as amended; 16 U.S.C. 661 et seq.).

Sincerely yours,

Larry E. Goldman
Field Supervisor

Enclosure

cc: EPA, Atlanta, GA
NMFS, Panama City, FL
ADCNR, Montgomery, AL
ADCNR, Spanish Fort, AL
ADCNR, Dauphin Island, AL
ADEM, Montgomery, AL
ADEM, Mobile, AL

FISH AND WILDLIFE COORDINATION REPORT

on

NAVIGATION IMPROVEMENTS

at

GOVERNMENT CUT, DAUPHIN ISLAND, ALABAMA

Submitted to:

U.S. Army Corps of Engineers

Mobile, Alabama

Prepared by:
Celeste Y. South

U.S. Fish and Wildlife Service
Fish and Wildlife Enhancement
Daphne, Alabama

January 1990

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PROJECT DESCRIPTION

The Mobile District Corps of Engineers (Corps) is presently conducting studies to determine the need, feasibility, and associated impacts of improvement of navigation in the Government Cut channel in Dauphin Island Bay, Alabama (see Fig. 1). The project is being studied under provisions of Section 107 of the River and Harbor Act of 1965, which authorizes the Corps to undertake studies related to the improvement of navigation and to construct improvements if economic justification exists.

The study has considered two disposal alternatives and six channel depth alternatives. Figure 1 shows both the primary and secondary disposal area. Table 1 shows the six channel depth alternatives. The preferred plan would involve the deepening of Government Cut from its existing 4 feet to 6 feet from Pass Drury south to Billy Goat Hole for a distance of approximately 4090 feet.

Approximately 17,258 cubic yards of sandy material would be disposed of in an upland beach area located on Dauphin Island. This designated spoil area extends from the jetty located at the extreme south end of the island to a point on Little Dauphin Island 2,000 feet north of what was formerly Pass Drury and 150 feet into the water. Continued use of this beach nourishment area is also proposed for future activities. The alternate disposal area is located at the eastern tip of Dauphin Island. Both disposal areas are previously used and approved disposal areas that are utilized in conjunction with the routine maintenance of the Dauphin Island Bay navigation project. Dredge material from maintenance activities will also be placed along this same area. The project sponsor is the Mobile County Commission.

AREA SETTING

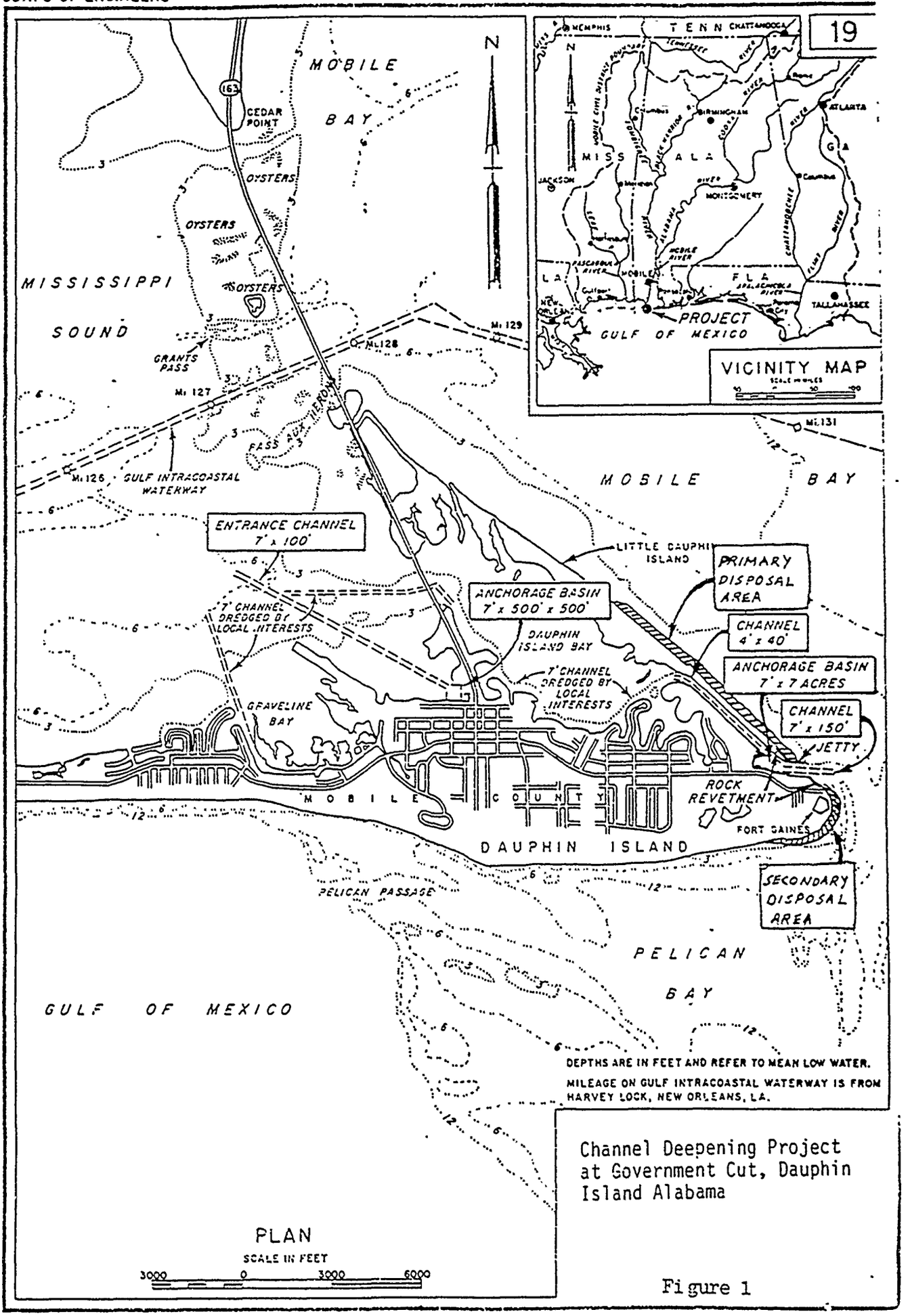
Government Cut is a man-made navigation channel that connects Dauphin Island Bay to Mobile Bay (see Fig.1) and, as such, is a tidally influenced waterway. Government Cut is approximately 4,090 feet long and has a basin width of 40 feet. It is currently maintained at a depth of 4 feet throughout its entire length.

The northeast bank is characterized by marsh areas which extend to Billy Goat Hole. The northwest bank is a sandy upland area with an expanding marsh located on the Cut side of the bank.

WETLANDS

Fish and Wildlife Service (Service) Definition

Typically, wetlands are lands where hydric saturation is the overriding factor in determining the nature of soil development and the types of floral and faunal communities inhabiting the terrain. The Service defines wetlands in its Classification of Wetlands and Deepwater Habitats of the United States as "...lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land



Channel Deepening Project at Government Cut, Dauphin Island Alabama

Figure 1

Table 1

The Analyzed Alternatives for the Depth of Government Cut Project, Mobile County, AL

DEPTH	5	5	6	6	7	7
ADVANCED MAINTENANCE	1	2	1	2	1	2
ALLOWABLE OVERDEPTH	1	1	1	1	1	1
CHANNEL WIDTH	40	40	40	40	40	40
NEW WORK QUANTITY	1,118	2,613	9,930	17,258	17,258	25,447
ANNUAL MAINTENANCE QUANTITY	1,120	1,120	1,120	1,120	1,120	1,120
50-YEAR MAINTENANCE QUANTITY	56,000	56,000	56,000	56,000	56,000	56,000

All depths given in the above table are in feet and the plane of reference is Mean Lower Low Water (M.L.L.W.).

Channel width is given in feet and refers to channel bottom width.

All quantities are given in cubic yards and are reported as in situ yardage (no bulking factor has been applied).

is covered by shallow water." (Cowardin, et al. 1979). Additionally, at least one of the following characteristics must be applicable to an area in order to be classified as a wetland: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominantly undrained hydric soils; and 3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year. The following section discusses the type of wetland found with the study area.

Estuarine Emergent Wetlands

In general, the estuarine system consists of deepwater tidal habitats and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land (Cowardin 1979). In the Dauphin Island area, tidal marshes are dominated by the plant species Juncus roemerianus and Spartina alterniflora. These marshes and nearby waterbottoms are an integral and valuable part of the Alabama estuarine system. This system provides vital spawning, nursery, and feeding habitat for a major portion of the marine and freshwater finfishes and shell fishes that inhabit the Alabama coastal zone. The detrital material produced in the estuary is a major food item of many marine fishes and lower food chain organisms.

The assemblages of organisms within an estuarine system range from fresh to marine in character with the estuarine environment often encompassing vigorously flushed to somewhat stagnant waters. The hydrologic conditions of an estuary influence the circulation, storage, and recycling of organic materials and nutrients which help assure a perpetual supply of ingredients to maintain high levels of biological productivity. The hydrology of Alabama's estuarine system is governed primarily by discharge of fresh water, tidal movements, and currents (Chermock 1974). Winds also influence the hydrological characteristics of the estuarine system.

Marshes also provide habitats for many plant and wildlife species. In addition, they buffer storm surges, stabilize shorelines, and filter upland runoff.

Aquatic Resources

Alabama's marine fisheries industry is one of the most important natural assets of the state and its success is directly related to the health of the estuarine system. Both the commercial and sport fishery significantly contribute to the economy of the Alabama coastal area.

The major commercial fishery categories are shrimp, crab, oyster, and finfishes; however, shrimping is economically the most important commercial fishery in Alabama (Heath 1979). The shrimp industry accounts for almost 91 percent of the retail value of all the commercial fishing in the State (U.S. Department of Commerce et al. 1979).

Public oyster reefs in Mobile Bay and Mississippi Sound cover over 3,000 acres. Most of these reefs are in the southern half of Mobile Bay. The major reefs include Klondike, Whitehouse, and Cedar Point (Fig. 2). Over

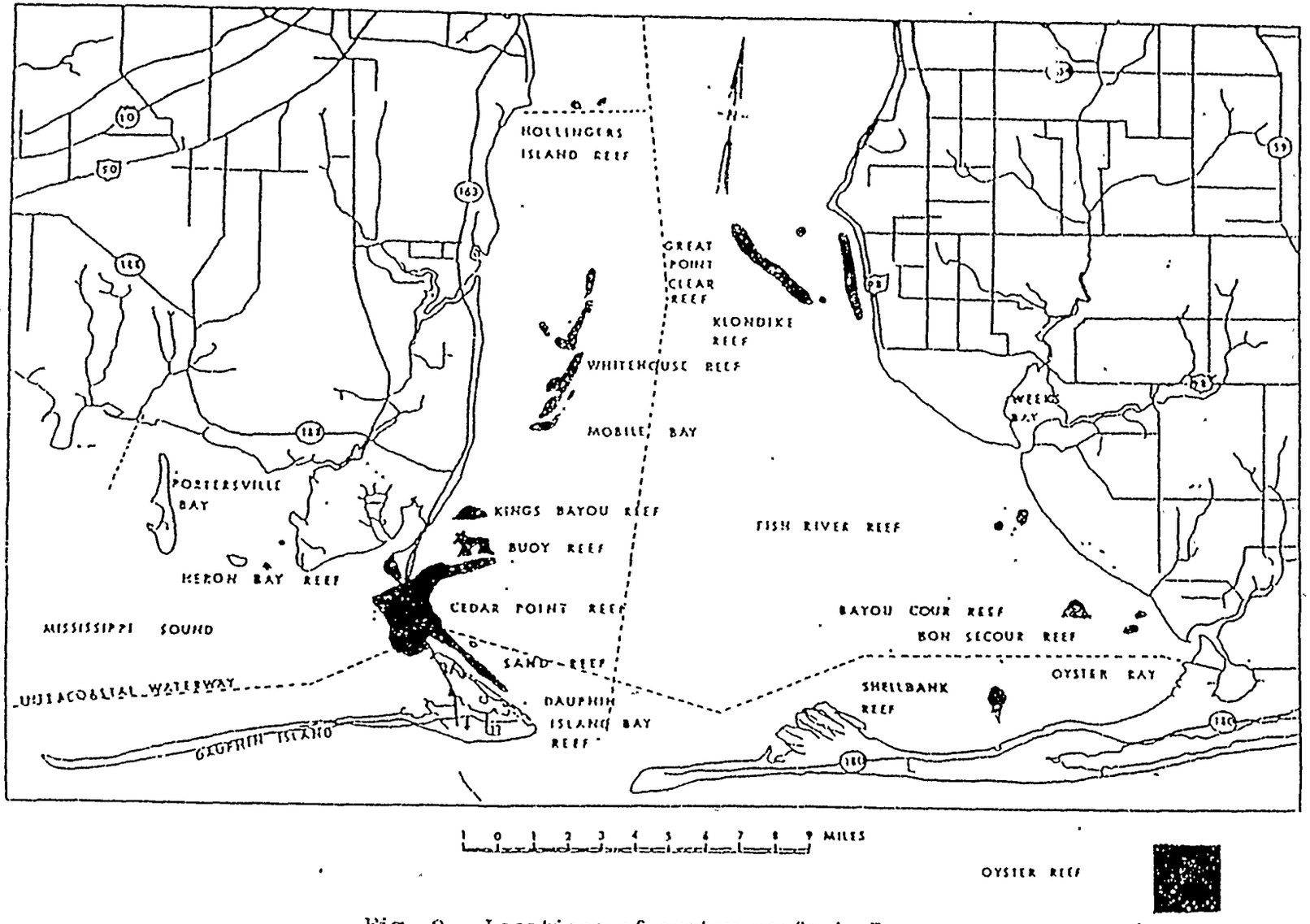


Fig. 2. Locations of oyster reefs in Bon Secour Bay, Mississippi Sound, and Mobile, Bay, AL (from Eckmayer 1979)

90 percent of the oyster landings come from the Cedar Point Reef (Eckmayer 1979). The commercial oyster fishery in 1976 provided $1.5 million at dockside and $6 million at the retail level to the economy of Alabama (U.S. Department of Commerce 1979). A significant economic loss has resulted from over 70,000 acres of waterbottoms being closed to oystering in the upper bay because of pollution. Sand Reef, one of the southern-most oyster reefs in Mobile County, was once the most productive reef in Alabama (Ritter 1896). The historical western boundary of Sand Reef lies in close proximity to Little Dauphin Island (Fig. 2). While this reef has not produced sizable oysters since 1985, the potential still exists for it to be an important commercial shell fishing area.

According to Swingle (1971), 233 species of fish occur in Mobile Bay. Major marine fishes that depend upon the estuarine waters of Mobile Bay during some period of their life and are of commercial importance in Alabama include: Atlantic croaker (Micropogonias undulatus), spotted seatrout (Cynoscion nebulosus), sand seatrout (Cynoscion arenarius), southern flounder (Paralichthys lethostigma), spot (Leiostomus xanthurus), gulf menhaden (Brevoortia patronus), and striped mullet (Mugil cephalus). Lazauski (1987) indicated that Alabama's marine recreational anglers spend approximately $75 million annually, a significant portion of which relates to Mobile Bay.

ENDANGERED AND THREATENED SPECIES

In Table 2 are listed the federally listed endangered or threatened species expected to occur in or near the project area.

To be in compliance with Section 7, the Corps has initiated consultation with the Service. Even if no adverse effects on endangered or threatened species are expected, their interest should be given full consideration during project planning. Some species are currently under status review and could become listed during the project construction period. We recommend the Corps stay informed on the status of these species.

EVALUATION METHODOLOGY

Evaluation of the impacts of this project on fish and wildlife resources in the project area and development of the proposed mitigation plan are based on the best professional judgement of Service biologists. That judgement is based upon field inspections of the project area, review of pertinent literature, and professional experience.

To ensure consistent and effective recommendations for mitigating the adverse impacts of land and water development on fish, wildlife, and their habitats, the Service has established a Mitigation Policy (Federal Register, Vol. 4, No. 15, January 23, 1981). Within the policy there are four Resource Categories (Table 3) that are utilized to indicate the level of mitigation recommended.

For the Government Cut Navigation Project, the Service has categorized the channel bottom that will be dredged as Resource Category III.

Table 2
Federally listed species in the project area
(E=Endangered; T=Threatened)

Species	General Distribution
Mammals	
Manatee, Florida (Trichechus manatus) - E	Coastal waters
Panther, Florida (Felis concolor coryi) - E	Entire state
Whale, right (Eubalaena glacialis) - E	Coastal waters
Whale, finback (Balaenoptera physalus) - E	Coastal waters
Whale, humpback (Megaptera novaeangliae) - E	Coastal waters
Whale, sei (Balaenoptera borealis) - E	Coastal waters
Whale, sperm (Physeter catodon) - E	Coastal waters
Birds	
Eagle, bald (Haliaeetus leucocephalus) - E	Entire state
Falcon, Arctic peregrine (Falco peregrinus tundrius) - E	Entire state
Pelican, brown (Pelecanus occidentalis) - T	Coast
Plover, piping (Charadrius melodus) - E	Coast
Warbler, Bachmann's (Vermivora bachmanii) - E	Entire state
Woodpecker, ivory-billed (Campephilus principalis) - E	South, W. Central
Woodpecker, red-cockaded (Picoides dendrocopos borealis) - E	Entire state
Reptiles	
Alligator, American (Alligator mississippiensis) - E	Coastal plain
Snake, eastern indigo (Drymarchon corais couperi) - T	South
Turtle, Kemp's (Atlantic) ridley (Lepidochelys kempii) - E	Coastal waters
Turtle, green (Chelonia mydas) - T	Coastal waters
Turtle, hawksbill (Eretmochelys imbricata) - E	Coastal waters
Turtle, leatherback (Dermochelys coriacea) - E	Coastal waters
Turtle, loggerhead (Caretta caretta) - T	Coastal waters

Table 3
Resource categories for determining levels
of mitigation requirements

Resource Category	Designation Criteria	Mitigation Goal
I	Habitat to be affected is of high value for evaluation species and is unique and irreplaceable on a national basis or in the ecoregion section.	No loss of existing habitat value.
II	Habitat to be affected is of high value for evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section.	No net loss of inkind habitat value.
III	Habitat to be affected is of high to medium value for evaluation species and is relatively abundant on a national basis.	No net loss of habitat value while minimizing loss of in-kind habitat value.
IV	Habitat is of medium to low value to evaluation species.	Minimize loss of habitat value.

The beach area to be affected by the project has been classified as Resource Category III. This area is valuable due to the avian habitat it provides.

PROJECT IMPACTS

Specific Impacts

Deepening waters for improved navigation will temporarily eliminate benthic organisms. The dredging operations will also produce a temporary increase in turbidity levels within the project area.

Endangered and Threatened Species

Federally listed endangered and threatened species are identified in Table 2. Of those species identified, only the piping plover is likely to occur within the project area. According to Zivojnovich (1987), the piping plover winters in the Dauphin Island area on the wet beaches to the north of this project and, as such, the project is not expected to have an adverse effect on this species (Fig. 3).

Coastal Barrier Resources Act

The Little Dauphin Island is part of the Coastal Barrier Resources System and as such requires consultation under the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). These comments are made pursuant to Section 6 of the CBRA. The purpose of the Act is to minimize the loss of human life; wasteful expenditure of Federal revenues; and damage to fish, wildlife, and other natural resources associated with coastal barriers. We concur with the Corps that the use of the dredge material as beach nourishment will help stabilize those portions of Dauphin Island and Little Dauphin Island. We also concur that the deepening of the channel represents maximum maintenance and not new construction.

Therefore, it is our conclusion that this proposed action is exempt under Section 6(a)(6) and Section 6(a)(6)(G) of the CBRA and is consistent with the purposes of the Act.

DISCUSSION

The Government Cut Project, as proposed, would have limited impacts on aquatic and terrestrial fish and wildlife resources. With the worst case scenario implemented as seen in Table 1, the impacts would still be negligible.

A primary factor determining the degree of impacts is the time of year dredging is conducted. Dredging is most damaging when conducted during peak spawning and migration periods (spring and early summer) and colonial seabird nesting periods (April 1 - September 15). The loss of benthic organisms and increased turbidity levels is expected to be minor and temporary so that no compensation requirements are deemed necessary for

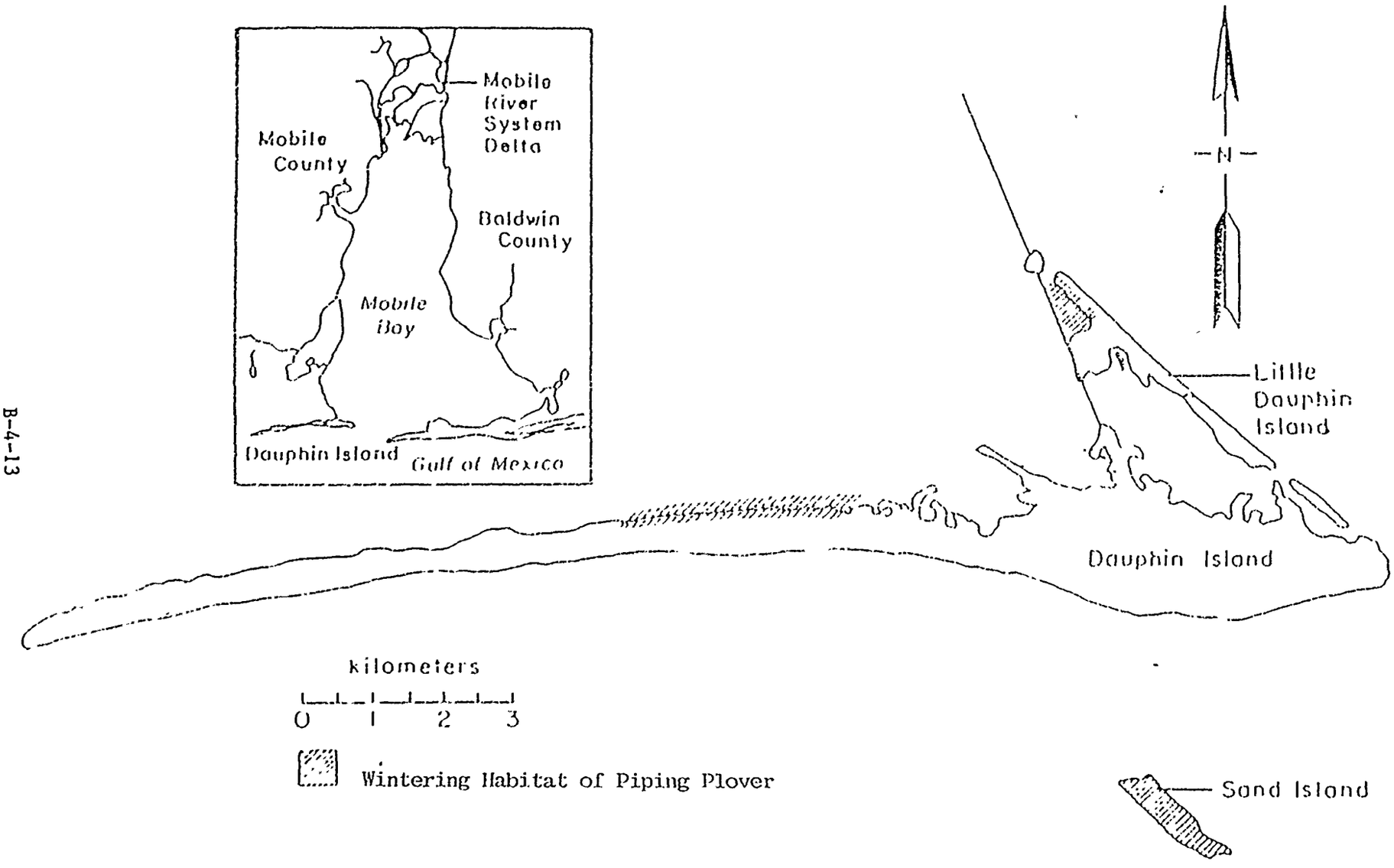


Figure 3. Map of the study area (from Zivojnovich 1987) showing piping plover's wintering habitat.

aquatic impacts. Construction can be scheduled to avoid conflicts with colonial nesting seabirds.

CONCLUSIONS AND RECOMMENDATIONS

Implementation of the Government Cut Project would not have significant impacts on fish and wildlife resources in the project area. This office has conferred with the Bon Secour National Wildlife Refuge and has determined that the Service has no conflict nor does it anticipate any problems relating to fish and wildlife resulting from the deepening of Government Cut. However, there are modifications of the proposed work that, if incorporated into the project, would further reduce these minor impacts.

The Service recommends the following modifications be incorporated into the proposed project and its construction:

1. Dredge during the winter months (December - March) at which time aquatic resource spawning, migration, and colonial seabird nesting activities are lowest.

2. Monitor disposal activities so that output and settling rates protect against an incident of over disposal and possible movement of dredged material into sensitive areas.

REFER TO PAGE EA-10 FOR MDO RESPONSES

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office
9450 Koger Boulevard
St. Petersburg, FL 33702

April 28, 1989 F/SER23:TAH:td

Mr. Curtis M. Flakes
Chief, Coastal Environment Section
U.S. Dept. of the Army
Mobile District, COE
Post Office Box 2288
Mobile, AL 36628-0001

Dear Mr. Flakes:

This responds to your April 18, 1989, letter regarding the proposed maintenance dredging of Dauphin Island Bay channel, Mobile, Alabama. A Biological Assessment (BA) was transmitted pursuant to Section 7 of the Endangered Species Act of 1973 (ESA).

We have reviewed the BA and concur with your determination that populations of endangered/threatened species under our purview would not be adversely affected by the proposed action.

This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat determined that may be affected by the proposed activity.

If you have any questions, please contact Dr. Terry Henwood, Fishery Biologist at FTS 826-3366.

Sincerely yours,

Terry Henwood for

Charles A. Oravetz, Chief
Protected Species Management
Branch

cc: F/PR2
F/SER1

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, ALABAMA 36628-0001

July 3, 1989

Alabama Historical Commission

JUL 6 1989

RECEIVED

REPLY TO
ATTENTION OF:

Environmental Resources
Planning Section

Mr. F. Lawerence Oaks
Alabama State Historic Preservation Officer
Alabama Historical Commission
725 Monroe Street
Montgomery, Alabama 36104

Dear Mr. Oaks:

The Mobile District, U. S. Army Corps of Engineers is considering improvements to the Government Cut segment of the Dauphin Island Bay, Alabama navigation project. Government Cut is a man-made channel through the island.

The work would entail deepening the existing channel from the current -4 feet mean lower low water (MLLW) to -7 feet mean lower low water with an additional 2 feet advance maintenance dredging. The quantity of new work material to be dredged from the channel is 25,000 cubic yards of sand. The dredged material will be placed on the beach Little Dauphin and Dauphin Islands adjacent to the project. Alternately, the material may be placed at the eastern tip of Dauphin Island adjacent to Fort Gaines for shoreline protection (Figure 1). Both of these disposal areas are previously used and approved for receipt of material from the Dauphin Island Bay navigation channel.

It is our opinion that the action will not affect significant cultural resources and that a cultural resources survey is not warranted. If you agree with this determination, please sign this letter in the space provided below and return it to me within thirty (30) days. Should you require additional information, please contact Ms. Dottie Gibbens at 205/694-4114.

Sincerely,

Hugh A. McClellan
Chief, Environment and Resources
Branch

Enclosure

CONCURRENCE:

F. Lawerence Oaks 5-14-89

F. Lawerence Oaks (Date)
Alabama State Historic Preservation Officer

B-4-17

SECTION 5
AGENCY REVIEW
COMMENTS AND RECOMMENDATIONS
MOBILE DISTRICT RESPONSES

GEOLOGICAL SURVEY OF ALABAMA

420 Hackberry Lane
P. O. Box O
Tuscaloosa, Alabama 35486 - 9780
(205) 349-2852

ERNEST A. MANCINI
State Geologist
and
Oil and Gas Supervisor

January 17, 1990

Mr. N. D. McClure, IV
Department of the Army
Mobile District, Corps of Engineers
P O. Box 2288
Mobile, AL 36628-0001

Dear Mr. McClure:

Personnel of the Water Resources Division of the Geological Survey of Alabama have reviewed the Detailed Project Report, Fort Gaines Channel (Government Cut) at Dauphin Island, Alabama. It is expected that deepening the channel will cause no significant effects on the water resources or hydrology of the area.

If we can be of further assistance, please contact us.

Sincerely,

Danny Moore

James D. Moore
Chief
Water Resources Division

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET N E
ATLANTA GEORGIA 30365

FEB 02 1990

N. D. McClure
Chief, Planning Division
Mobile District, Corps of Engineers
P.O. Box 2288
Mobile, AL 36628-0001

Subject: Environmental Assessment for Navigation Improvement along Fort Gaines Channel(Government Cut), Mobile County, AL

Dear Mr. McClure:

Pursuant to Section 309 of the Clean Air Act, EPA, Region IV has reviewed the subject document. Form the information provided we do not anticipate and significant and/or long-term adverse environmental consequence of this action and agree with your Agency's Finding of No Significant Impact. This assessment was made on the basis of the fact that the impacts associated with the additional channel depths proposed would not be materially different from those currently being experienced by the benthic communities in the authorized channel. Further, the proposed dredged material disposal sites, Little Dauphin Island and the beach adjacent to Fort Gaines, were agreed upon during the initial interagency coordination on this project.

Sincerely yours,

Heinz J. Mueller
Chief, Environmental Policy Section
Federal Activities Branch

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Affairs
Richard B. Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303

FEB 15 1990

ER-90/49

Mr. N. D. McClure
Chief, Planning Division
U.S. Army Corps of Engineers
Post Office Box 2288
Mobile, Alabama 36628-0001

Dear Mr. McClure:

The Department of the Interior has reviewed your Detailed Project Report and Environmental Assessment for Fort Gaines Channel (Government Cut) Mobile County, Alabama.

The proposed project is for dredging 17,258 cubic yards of material and the placement of the material on disposal areas. The two proposed disposal sites have been used previously and are currently approved for routine maintenance of the project channel. Because these are existing disposal sites, we anticipate no additional adverse impact on resources as a result of the proposed project.

The Department of the Interior has no comments on the proposed project or the document as presented.

Thank you for the opportunity to review this document.

Sincerely yours,

James H. Lee
Regional Environmental Officer

United States Department of the Interior
FISH AND WILDLIFE SERVICE

P.O. Drawer 1190
Daphne, Alabama 36526

February 21, 1990

Curtis M. Flakes
Chief, Coastal Environment Section
U.S. Army Corps of Engineers
P.O. Box 2288
Mobile, Al 36628-0001

Dear Mr. Flakes:

This responds to your letter dated February 13, 1990, requesting concurrence on Section 7 of the Endangered Species Act for the proposed navigation improvements at Government Cut, Dauphin Island, Alabama.

Based upon our knowledge of the proposed area and the environmental assessment which was proposed for this project, we have determined that there are no federally listed endangered or threatened species for which the Fish and Wildlife Service has responsibility that would be expected to occur in or near the project area.

Sincerely,

Larry F. Goldman
Field Supervisor

COORDINATION WITH OTHERS

Coordination in the form of a public meeting, telephone conversations, written correspondence and other informal contacts has included representatives of the U. S. Fish and Wildlife Service (FWS), National Marine Fisheries Service, Alabama Historical Commission, various local agencies and the public. This document was coordinated with the Environmental Protection Agency, Alabama Department of Environmental Management and other interested agencies and publics. These coordination activities ensured that the proposed plan is properly designed and fully acceptable to the agencies and the public.

Coordination with the FWS was especially important in determining the impacts of the project on fish and wildlife resources. A field trip was made to the project area with the FWS to analyze the habitat in the channel and disposal areas and to determine measures that could be incorporated into the proposed plan to reduce the overall impacts on fish and wildlife resources.

A draft Fish and Wildlife Coordination Act Report was recieved which contained fish and wildlife mitigation recommendations. These recommendations are the same as those listed in the final Fish and Wildlife Coordination Act Report and have been incorporated into the recommended plan. A copy of the final FWS report is in Section 4 of Appendix B. These recommendations and the Mobile District responses are included in the Environmental Assessment Section of the report.